

## He Wields High Degree Of Authority

By Jeffery Beeler

CW West Coast Bureau

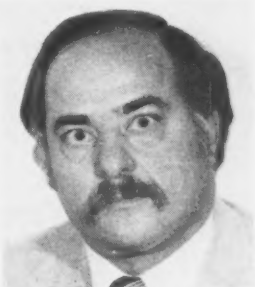
LOS ANGELES — If a corporation were an army and a DP department one of its divisions, Edward Lustig would probably hold the rank of one-star general.

As Occidental Petroleum Corp.'s corporate director of management information systems (MIS), Lustig doesn't exactly qualify as his firm's chief of staff, but he is still considered one of the company's top-ranking officers.

Lustig is the first to admit he wields an unusual amount of authority for an MIS administrator. Many of his counterparts

at other large companies occupy a much lower position in their corporate chain of command, he said. They're like lieutenants dutifully executing the orders of their superiors and immersing themselves in the day-to-day operations of their divisions.

Lustig, by contrast, operates in an echelon several steps removed from the routine details of command. As one of the corporate brass, he mans the high ground far behind his front-line troops. From that vantage point, he can survey Occidental's whole MIS battlefield, (Continued on Page 8)



Edward Lustig

# COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

daily Newspaper Second-class postage paid at Boston, Mass., and additional mailing offices © 1979 by CW Communications/Inc.

May 14, 1979

\$1.00 a copy; \$25/year

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NEWSPAPER

## DP in Disasters: Helpful... Or Not?

### Some Post-Tornado Luck

By Don Leavitt  
CW Staff

WICHITA FALLS, Texas — A chance combination of DP-related people and products helped provide quick, accurate information about conditions and survivors last month after a killer tornado devastated a quarter of this city of 100,000.

Talk about needing a system "yesterday" — programming

for the system to provide that support began several days after the tornado, yet it turned out to be the second largest disaster inquiry operation the Red Cross had ever handled.

Despite that, however, the operation went so smoothly that national Red Cross headquarters is now evaluating what was done and what (Continued on Page 6)

### No Help in Earthquakes

By Jeffery Beeler

CW West Coast Bureau

MENLO PARK, Calif. — Earthquakes continue to catch San Francisco Bay area residents by surprise despite the best efforts of a computer-aided research team to predict them.

For the second time in 10 days, scientists and processors at the National Center for

Earthquake Research (NCER) were unable to detect the tell-tale early-warning signs of a tremor that rattled windows as well as nerves throughout a wide swath of Northern California.

The latest seismic surprise for the NCER staff came last week when a nighttime tremor centered 10 miles east of San (Continued on Page 8)

### Intuition: Missing Element

By Tim Scannell

CW Staff

CAMBRIDGE, Mass. — It's a classic case of putting the computerized cart before the meteorological horse.

Relying heavily on computers, satellites and other electronic aids to predict changing weather patterns, contemporary forecasters are neglecting traditional "seat-

of-the-pants" methods that are largely based on experience, according to a professor here at MIT.

"The young forecasters, in particular, do not have the experience that forecasters had a generation ago when they entered upon comparable forecasting responsibilities," Prof. Frederick Sanders said. (Continued on Page 6)

## Rotating Blackouts Menace Systems on West Coast

By Brad Schultz

CW Staff

SAN FRANCISCO — DP users in northern and central California face the prospect of rotating blackouts, known to destroy computer systems, if the Rancho Seco nuclear power plant near Sacramento remains closed after August.

Rotating blackouts entail power cutoffs for different districts at different times

within a utility region. Without costly antiblackout gear, computer systems switched on just as a blackout ended would be devastated because their circuitry could not tolerate the resulting power surge, experts believe [CW, May 7].

Power spikes at 2,100V to 5,000V when current normally flowing at 120V is suddenly resumed, according to Ken Brill, president of Atlas

Energy Systems of South El Monte, Calif. With advance word of a rotating blackout scheme, users would thus need to keep their systems down for possibly an hour after power resumed to minimize such transient conditions, Brill said.

However, transients are difficult to predict, and their effects might vary with the processor involved. Moreover, the rotation might cause power fluctuations that randomly reverse the values of bits — 0 to 1 and 1 to 0 — anywhere in the system.

Pacific Gas and Electric Co. (PGE) here will impose that method of rationing if its reserve supply of electricity falls below 1.5% of demand, a spokesman told Computerworld.

Serving California from Bakersfield — about 100 miles north of Los Angeles — to nearly the Oregon border, PGE tries to maintain a 15% to (Continued on Page 4)

## Worldwide Group Set To Serve All Users

By Marguerite Zientara

CW Staff

BOULDER, Colo. — Users of every kind of computer system or service may now have a common source of unbiased, independent information in the newly established, international Association of Computer Users (ACU).

Formed by the merger of two smaller associations sharing the same officers and board of directors — the Association of Time-Sharing Users (Atsu) and the Association of Small Computer Users (Ascu) — ACU hopes to become the "long-needed independent organization that can provide ... unbiased information about computing alternatives," according to its president, Hillel Segal.

ACU's most important function will be the continuation and expansion of a series of benchmark studies originated by Ascu. Previous benchmarking compared the capabilities of computers in the \$15,000 to \$25,000 price

range, principally addressing response times and running speeds [CW, April 9].

The studies will now be expanded to cover all computer hardware being actively marketed, and all association members will have access to the benchmark reports, Segal said.

(Continued on Page 6)

## Court Decision Outlaws Range of EFT Operations

By Don Leavitt

CW Staff

WASHINGTON, D.C. — Congress is about to hold hearings to decide what it should do in the wake of a recent decision by the U.S. Court of Appeals here that outlawed a range of electronic funds transfer (EFT) operations.

The court said, in essence, that federally chartered commercial banks, savings and loan associations and credit

unions are all, in different instances, providing services that go beyond what the relevant laws allow.

But the problem may lie in the laws themselves, the three-judge panel implied as it delayed the effective date of its order until Jan. 1 "with the expectation that the Congress will declare its will upon these matters."

In particular, the court ruled that federal regulators were (Continued on Page 4)



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*Computerworld* can be purchased on 35 mm microform through University Microfilm Int., Periodical Entry Dept., 300 Zeeb Rd., Ann Arbor, Mich. 48106. Phone: (313) 761-4700. *Computerworld* is indexed: write to Circulation Dept. for subscription information.

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# Bogus Micro Company Uncovered

By Ann Dooley  
 CW Staff

TUCSON, Ariz. — World Power Systems, Inc., a bogus microcomputer firm here, abruptly ended its alleged consumer fraud recently when it became clear that discovery was imminent.

A mail order firm, World Power advertised I/O boards, interfaces and so forth in several hobby magazines and collected money for orders, but never filled them.

The alleged perpetrator of the scheme is reported to have fled the area, leaving behind money and computer equipment — valued at \$100,000 to \$250,000 — in his haste to elude authorities.

The man suspected of masterminding the hoax was involved in several swindles in the computer and electronics industries. He is already wanted by California authorities for escaping from Chino State Prison, where he was serving a three-year sentence for a similar rip-off.

The suspect, Norman Henry Hunt, was using the alias of James Anderson in this computer hoax, but also has called himself Col. David Winthrop, Harold Bender, Robert Renfro and William Scoville, authorities said.

## Promoted World Power

In 1977, using the name Winthrop, Hunt established a firm called Data-synch, selling terminals and related equipment through the mail. All the equipment was later found to be simple mock-ups, incapable of operation. Hunt was convicted, but escaped from the California prison and went to Tucson, where he established the new company, allegedly using the techniques he employed in the Datasynch swindle.

Hunt apparently established World Power at the beginning of this year and began advertising his equipment in *Interface Age*, and *Creative Computing*, authorities said. Anderson bought six pages of ad space in each

magazine, running ads that featured a computer hobbyist, his wife and the computer equipment he had supposedly developed.

The man in the advertisements, George Perry Pollock, allegedly collaborated with Hunt in the rip-off scheme and was arrested while trying to move out some of the computer equipment left in Hunt's house.

Hunt's advertised products included some Radio Shack TRS-80-compatible equipment and an I/O board. Suspicion was aroused when a *Creative Computing* staff member realized that no circuit etches were shown on the I/O board pictured in the advertisements.

*Creative Computing* Editor John Craig called the company and asked if he could pay a visit. An appointment was arranged, but on April 25, two days after Craig's phone call, Hunt cleared out. Upon hearing Craig's name, Hunt apparently became suspicious; the two knew each other during the time of the Datasynch swindle.

Hunt and his wife, Lee, induced two of the company secretaries to accompany them, saying they were going to start an office elsewhere. After several days of aimlessly driving around Texas, both women returned to Tucson.

In the meantime, one woman's father became suspicious and reported the matter to the police, who secured a search warrant and began watching Hunt's abandoned office and home.

The two secretaries claimed they were kept so busy they had no idea what was going on and are believed by authorities to be innocent.

"Winthrop has been a con man all his life and is very, very good at it," Craig stated. His technique is to establish credibility and then "take the money and run." It's what's known as a "bust out" by police, he noted.

## Numerous People Swindled

Although so far it is unknown how much money is involved in this latest

"bust out," Hunt allegedly managed to swindle a significant amount of money from numerous people before being forced to close his operation.

The hobby magazines in which Hunt advertised were not paid for the space used. The hobbyists who sent money expecting to receive the advertised equipment, the computer parts firms that sold Hunt components on credit and the dealerships that paid Hunt to distribute his fraudulent equipment may never be paid back.

If the "bust out" had not been cut short, Hunt would have kept collecting money and equipment while maintaining an appearance of respectability, Craig said. Then, after several months, he would have taken the money and traveled to another state to sell the unpaid computer equipment.

The whole swindle usually lasts several months before it is dissolved, Craig said, noting that this scheme was probably broken up a month before Hunt planned to end it.

## Under Investigation

The Pima County Attorney's Office, the Department of Public Safety and federal postal inspectors are investigating the case because mail fraud was involved. Susan Moore, criminal investigator for the county attorney's office, was the official who arrested Pollock on a conspiracy and fraudulent scheme (or artifice) charge. Pollock is awaiting a grand jury hearing.

Hunt, whose swindles have been staged in Nevada, Texas, Arizona, California and Georgia, was last seen in Oklahoma and is believed to be heading northeast.

Reported to be in his mid-40s, Hunt is six feet three inches tall, 220 pounds and red-haired. He is described as a smooth talker with a slight southern drawl and is "very overpowering."

His wife, Lee "Anderson," also being sought by police, is in her late 30s, has strawberry-blond hair, wears large, frameless glasses and is five feet six inches tall.

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# POW!

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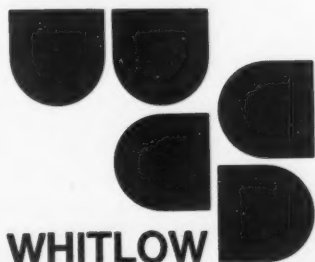
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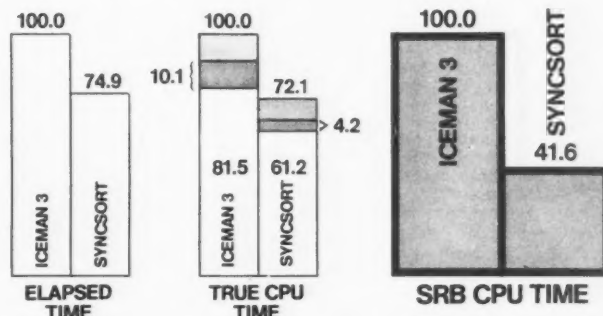
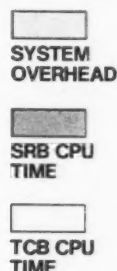
Most sort programs — SyncSort is not one of them — suffer from an excess of "locked-up SRB Time." And this makes 'em mean and unpredictable as a scorpion with a toothache.

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- SRB Time (Service Request Blocks) is non-preemptible. Programs running under SRB CPU Time "will not lose control to higher priority tasks or SRBs until control is given up voluntarily," as IBM's own Systems Programming Library puts it. In other words, plenty of sweat for everybody. Particularly for non-sorting jobs in the mix if your sort uses a lot of SRB Time.

The charts below show you the difference in SRB Time between SyncSort OS and a leading 97-pounder — IBM's 5740-SM1, Release 3:

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## Security Breach at Reactor Probed

SURRY, Va. — The Federal Bureau of Investigation is looking into a breach of computer-controlled security that entailed "willful damage" of reactor fuel at Virginia Electric & Power Co.'s nuclear plant here last week.

An unknown intruder overrode a computerized, magnetic card-controlled access system and sprinkled a corrosive white substance on 62 of 64 new fuel elements stored in a build-

ing next to the reactor. The unidentified substance corroded the zirconium metal surrounding the uranium fuel, rather than the radioactive rods themselves, a Virginia Electric spokesman said.

The damaged fuel elements were scheduled to be used this summer. The uranium may still be usable, but refabrication of the elements could cost \$6 million, the spokesman estimated.

A computer system reportedly logs each use of the access cards and identifies the card holder involved. The FBI is examining those records.

Virginia Electric has two reactors at the Surry plant. The Nuclear Regulatory Commission closed one unit last March because computer-designed piping seemed unsafe in the event of an earthquake. The other reactor is closed for repairs.

## Rotating Blackouts Menace West Coast

(Continued from Page 1)

20% reserve to tide over the region in power emergencies, the spokesman said. The Rancho Seco shutdown, recently ordered by the Nuclear Regulatory Commission (NRC) and endorsed by California Gov. Jerry Brown, has trimmed the reserve to 9% for the May-June period. A 10% reserve was termed "rock bottom" for reliable service to the public.

If the nuclear plant remains closed in July and August, the reserve will then be only 4%, the spokesman said. PGE enters Stage I of a "planned control" alert when the backup level drops under 5%.

In Stage I, the power company would issue newspaper, radio and television appeals for voluntary reductions in electricity consumption. But if the reserve fell below 3%, the firm would initiate Stage II, interrupting power flow to low-priority customers and intensifying its media appeals for conservation.

Should the reserve fall short of 1.5%, PGE would — in Stage III — rotate blackouts among each of its 20 regional "blocks." In succession, each block would be powered down for one to four hours every day.

### Rancho Seco's Role

Babcock & Wilcox Co.'s (B&W) design of Rancho Seco closely resembles the design of the General Public Utilities Co. plant on Three Mile Island

near Harrisburg, Pa. The Three Mile Island facility began overheating on March 28, jeopardizing the health and lives of thousands of people.

The NRC suspended operations at Rancho Seco and six other B&W nuclear plants in other states two weeks ago. To forestall the chance of history repeating itself, each plant must demonstrate major safety upgrades before the commission will lift its suspension.

With Rancho Seco, PGE has served the San Francisco-San Jose area known as Silicon Valley because it is one of the nation's heaviest concentrations of computer technology manufacturers, users, world-renowned research institutions and university computer science departments.

Can users obtain priority status or even exemptions if PGE decides to ration electricity? While the firm would do its best to avoid cutoffs of socially critical customers — such as hospitals — in Stage II, breaks for DPers may prove impossible to manage fairly, observers believe. The city of Austin, Texas reportedly found it could not even tally all the local users when the city considered rotating blackouts a few years ago.

Even if Rancho Seco resumed generation of electricity right now, the region's power reserve would probably not exceed 10% this summer, the PGE source stated. While PGE is trying to purchase more electricity from other utility providers, such as Southern

California Edison Co., the latter also faces shortages expected to be most critical this summer, when air conditioning is used heavily.

Areas in the PGE region endure the nation's hottest weather. Summer temperatures frequently exceed 100°F in the Central Valley that extends for hundreds of miles between the Sierra Nevada mountains and the Pacific coastline.

### Hinging on Five Factors

Five factors will determine whether the nation's most populous state can avoid blackouts this year, according to the spokesman. One is weather. The hotter the summer, the more likely blackouts will occur.

The Rancho Seco situation is another. Stage III seems inevitable by September if the plant remains idle that long. And September, even early October, is often the region's warmest time of the year.

The condition of PGE equipment is also important. Besides the firm's nuclear facilities, there are many miles of wire and hundreds of conventional utility stations that could fail, aggravating the power crunch. Many of those stations are in the areas prone to summer forest fires — and no part of

## Seminars Set On Power

ROCKVILLE, Md. — Failures of data and word processing equipment caused by summer brownouts, lightning and other power problems will be addressed in a two-day seminar scheduled to tour the nation in coming months.

Computer Power Management Corp. said its seminars will review "the key factors in obtaining a cost-effective solution to power-induced problems." Topics slated for discussion include study team organization; use of management modeling; failure identification; failure cause analysis; how to minimize failure impacts; and how to estimate the cost of failures and solutions.

Selecting a solution and preparing a report for management will also be treated. The seminars will be held in Chicago June 11-12; Los Angeles, June 14-15; Dallas, July 16-17; Boston, Aug. 9-10; Denver, Aug. 14-15; and elsewhere at other times.

Computer Power Management can be reached at Box 1403, Rockville, Md. 20850.

California is free from the chance of earthquakes.

A fourth factor is the extent to which Californians cooperate with electricity conservation programs. Currently subject to mandatory gasoline rationing and gas prices approaching \$1 per gallon, residents are expected to travel less this summer and hence consume more power at home.

Finally, PGE's attempts to buy electricity from another provider may prove crucial, the spokesman said. Since the electricity crunch is nationwide, potential sellers in many areas may be inclined to hoard supplies.

## EFT Operations Outlawed

(Continued from Page 1)

wrong in permitting commercial banks to allow "automatic fund transfers" between savings and checking accounts, in permitting savings and loan associations to run "remote service units" in locations away from association offices and in letting credit union members write "check-like share drafts" on their savings accounts.

With offerings such as these, the three "separate and distinct types of financial institutions," created by Congress to support different requirements, are reaching the point of "offering virtually identical services to the public, all without benefit of congressional consideration and statutory enactment, the judges said.

### Three Suits Joined

The broad-ranging decision came about after Justices Carl McGowan, Edward A. Tamm and Malcolm R. Wilkey joined three suits that had been brought separately through the lower courts. In those actions, the American Bankers Association had sued the National Credit Union Administration; the Independent Bankers Association of America had sued the Federal Home Loan Bank Board; and the U.S. League of Savings Associations had sued the Federal Reserve Board and the Federal Deposit Insurance Corp.

Congress may well act on the issue this year. "It's a 20-80 chance they'll do something before summer recess, 50-50 they'll do it before the end of the year," in the judgment of one observer who felt the action would be to liberalize the current statutes to allow the plans now outlawed.

### Defendants' Options

Meanwhile, the defendants are assessing their next moves. The Federal Home Loan Bank Board is likely to go back to the appeals court to ask that the cases be broken in part again and decided separately since they involve different issues.

Another option the defendants have is to seek a Supreme Court review of the decision through the offices of the U.S. Solicitor General. While there is a time limit for seeking such a review, it has been suspended until the appeal to the lower court is resolved.

The result of all this legal action, assuming Congress does loosen the reins on the financial institutions, is that the institutions will get into tremendous competitive battles. DP staffs will have to develop, and be ready to install at a moment's notice, programs to support all kinds of EFT operations, according to one observer.

It will be a very interesting nine months, he commented wryly.

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# To Guard Against Tampering Encrypted Software Urged for Nuclear Plants

By Brad Schultz  
CW Staff

BETHESDA, Md. — Data encryption could go a long way toward ensuring the integrity of software that supports nuclear power plants, according to an authority on software cryptography.

The long, complex software programs used by nuclear plants are vulnerable to tampering, which might be malicious or simply foolish, according to Herbert S. Bright, president of Bethesda-based Computation Planning, Inc., which mainly develops security software for the banking community.

People can modify program segments without telling anyone unless those segments are encrypted, Bright said. Nuclear technicians thus run the risk of using programs different from what they believe they are using.

Encryption is the only way a technician can know whether a given program is exactly what he thinks it is, Bright emphasized.

Some nuclear industry software computes the thickness of piping through which water flows to cool a reactor's core. The Nuclear Regulatory Commission has recently found the piping of a number of nuclear plants to be far below acceptable stress tolerances because design software used invalid algorithms [CW, May 7].

## Strong Safeguard

At present, the most common civilian applications of encryption are in support of electronic funds transfer (EFT). In that arena, encryption determines who can access data transmitted through an EFT network and can verify the identity of a data sender, effectively providing an "electronic signature."

But encryption could also prevent unauthorized personnel from changing an important program, such as one supporting a nuclear plant. No other means of data protection, including password schemes and control software that locks out certain terminals, is as difficult to penetrate, Bright maintained.

Encryption is the only appropriate way to safeguard data, such as a program, stored openly on magnetic tape, he said. Reels of tape can simply be unwound and their data copied or altered. At reactor plants, such reels are wide open to security breaches.

## Data Scrambling

Encryption involves "scrambling" data prior to transmission or storage. A person accessing encrypted data is supposedly unable to comprehend the data unless he can unscramble it.

In recent years, hardware devices and software programs have been used to encrypt data processed by a computer system. The procedure by which data is computer-encrypted is normally represented by a binary string called a "key."

Sometimes users change their keys frequently to minimize the chances of a breach. Some devices randomly generate a key so not even the sender in an encrypted communications network could know or divulge the means of unscrambling.

A high-speed computer system might be used in an attempt to "crack" a key in the most straightforward manner —

by trying each key possibility until one rendered the data comprehensible.

Sometimes programs are innocently altered by people who believe they are improving performance, Bright observed. Even if the changes are improvements, however, they can render analysis based on the previous version of a routine irrelevant to analysis based on the "upgraded" version without other people knowing that relevance was lost.

## Modified Programs

A number of programs commonly used by the nuclear industry have undergone several formal revisions over a period of years. One of the best known

is Relap, a Fortran program originally written by the Idaho National Engineering Laboratory (Inel) to simulate nuclear plant operations [CW, April 9].

Although Relap is usually used to design a plant, Inel has employed the program in recent weeks to analyze conditions at the crippled Three Mile Island facility.

Two types of flaws are possible with a program like Relap, Bright said. The most fundamental flaws would lie in the mathematical algorithm on which the program is based. Cryptography is not concerned with assuring an algorithm's validity; that might be the responsibility of a software expert

versed in nuclear engineering and fine points of mathematics and logic.

The other broad type of flaw involves differences between versions or revisions of a program. Software developers like Inel scrupulously document the discrepancies between various releases of a major program.

But patch-up developments sometimes proceed too hastily — and not everyone is scrupulous, Bright noted.

As supervising scientist of Westinghouse Electric Co.'s Computation Planning Section in the late 1950s, Bright worked with the first generation of nuclear reactors, which served U.S. Navy submarines and surface vessels.

## If the Computer Industry Cast a Disaster Film



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There are, of course, many features fundamental to successful systems, and the ones to look for are:

Minimal Resources	Programmer Productivity	Documentation/Education
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# Coincidence Brings Texans Post-Tornado Luck

(Continued from Page 1)

might be added to the programs that were developed so quickly, to make them useful to other chapters and other situations.

Here's how it all went together:

The local Red Cross chapter happened to have its own in-house DP capability — an IBM System/32 — and a person — Tom Solnok — whose job is primarily administering the blood program but whose "first love" is computers.

IBM has a van that it drives around the region to demonstrate the System/34. The van with its small system happened to be in the area when the twister struck.

Wichita Clutch Co. happened to have two CRT terminals it had received but not yet installed on its own system. So it loaned them to the Red Cross/IBM team to expand the bank of data entry and inquiry stations that were tied into the System/34.

Sheppard Air Force Base happened to be nearby, and the chain of command there was quick to make facilities, including power lines and space, available so the Red Cross could set up a Disaster Welfare Inquiry (DWI) office, based on the van-installed System/34.

The tornado struck on a Tuesday evening. A day later Solnok realized his efforts on the batch-oriented System/32 couldn't keep up with the flood of constantly changing information. But he felt his crew might at least be able to put into alphabetical order the lists of people known to be in shelters, for example.

By Friday morning Solnok had learned of the IBM van and had requested permission to use it. He got the go-ahead by noon, and by mid-afternoon the van was moved to Sheppard, the System/34 was wired into the Air Force base power supply and the DWI office was at least formally established.

Solnok and IBM system engineers Mike Kenney and Dwane Palmer did the programming for the file building

and inquiry routines, using RPG-II and several of the workstation utilities available on the System/34.

IBM salesman Harold Romoser was also at the DWI site "doing whatever he could" to assist, Solnok said. Serviceman Dale Glossen was also very helpful, managing the power lines and other facilities.

During the two weeks in which the system was used, it was generally configured with six CRTs, including the two from Wichita Clutch. Three or four of the terminals were used for inputting data, the other two or three were used for inquiries.

And inquiries they received. Solnok estimates the DWI office got more than 12,000 requests for information about people, and they came from all

over, including Argentina. "I can't tell you how good it felt to be able to give that caller a good answer in just a minute... thanks to the CRT," he said.

With the system, the Red Cross was usually able to tell exactly where a person was and, in many cases, provide a phone number through which that person could be reached.

## Quick Disaster Aid

But the system also helped in managing the grants made to people for food, shelter and clothing. And after the first crush of inquiries was over, Red Cross workers went out and noted street by street which homes and buildings were damaged and how severely.

That data was recorded and printouts went to federal disaster relief offices.

That kind of orderly documentation enabled them to start providing aid much more quickly and effectively than would have been possible otherwise, Solnok said.

The files on the System/34 included about 6,000 records. These originally were individual records, but as more information became available, they were transformed into family records. This kept the file size within limits and often provided faster answers since callers were normally interested in whole families, he said.

Although the IBM demonstration van had its own generator, it was intended for limited use, not exceeding three or four hours. Tied into Sheppard's power, the System/34 was used around the clock.

# Intuition Seen Missing in DP Forecasting

(Continued from Page 1)

Present-day meteorologists are trained to work mostly with computer guidance and simulations that may not be accurate predictors of weather.

Sanders, who teaches a course in meteorology at MIT, bases his conclusions on a 12-year study of weather forecasts conducted by students and faculty at the university. Surprisingly, his findings indicate that computer technology has increased overall forecasting accuracy at the rate of only about .5% per year.

"The [meteorological] gospel reads that with increasing knowledge, greater elaboration, sophistication, computing speed and so on, progress will inevitably follow," the instructor noted. However, "it's probably taken longer for computers to make a positive impact on forecasting skills than people at the beginning of this line of work would ever have guessed."

Computers "come pretty close to duplicating the skills that were there all along" and only extend prediction ability in some long-range experiments, such as air pressure pattern and

upper air wind movement predictions, Sanders continued.

## Overfeeding the Deer

Drawing an analogy between computer-based weather-forecasting techniques and a tourist-fed deer in the woods, the MIT professor detailed the detrimental effects of leaning too heavily on seemingly infallible technology.

"Fed too frequently, a deer can't forage for itself during the winter and dies," Sanders explained. "We see something of that happening to forecasters when the [computer] system crashes and everybody tears their hair out saying, 'Oh my goodness, how am I going to put out a forecast?'"

"I'm old enough to say, 'Well, you put it out the way you would have 30 years ago,'" he said.

The MIT scientist also pointed out that the majority of weather patterns are usually quite complicated and that small meteorological formations sometimes have the potential to develop into major fronts.

"You always have the problem that [a weather pattern] may be so small that you don't initially observe it," Sanders stated. "And if that's true in general of the way the atmosphere operates, then... you can't reliably compute the way in which it may snowball into something bigger."

Computer simulations aren't always accurate, and "if you change the initial state [of the weather] just a little bit, the simulated or calculated feature behavior becomes quite different rather quickly and may or may not correspond to the way the weather is, in fact, going to behave."

## Continuing Controversy

Of course, it can be argued that a forecaster should stick to the computer-dominated route because that is where the future lies; there is no scientific proof that forecasters will improve their skills with more and more experience.

Proponents of this philosophy claim that meteorologists already know everything there is to know about experimental forecasting techniques, Sanders observed. This methodology rift has created a small-scale battle, pitting the defenders of "pure experience" and a "familiarity with patterns and pattern progressions" against the strict adherents to "physical science, fluid

dynamics and thermodynamics."

However, regardless of the way forecasters predict meteorological events — totally by computer or with a generous portion of experience — today's forecasts are, for the most part, fairly accurate. In fact, weather watchers are on target.

In order to get a 100% accurate 24-hour-in-advance forecast, "you'd have to spend the majority of the gross national product observing the initial state of the atmosphere. And it's pretty clear to everybody that we aren't going to do that because it's not that important to us."

# Group Covers All Size Systems

(Continued from Page 1)

According to the May/June issue of the ACU newsletter, "Interactive Computing," past benchmarks have uncovered "enormous disparities — as much as a factor of 20 — in the performance of similarly priced computers running the same task."

ACU, filling what it calls "a great need," will be "completely independent, which gives us the freedom to serve our membership to their greatest advantage by being absolutely candid," according to Segal.

Most other associations are segmented — that is, they're closely tied to computer manufacturers. In fact, many are captive organizations sponsored by specific manufacturers.

## Seven Sections

ACU has approximately 3,500 members — 1,500 from Atsu and 2,000 from Ascu. The original organizations will become divisions of ACU and five new divisions have been added.

The seven divisions include the Small Computer Section, formerly Ascu (for computers costing up to \$50,000); the Midi Computer Section (for computers from \$50,000 to \$200,000); Large Computer Section (\$200,000 or more); the Word Processing Section; the Distributed Processing Section; the Home and Hobbyist Section; and the Time-Sharing Section, formerly Atsu.

Other sections will be initiated as member needs dictate, Segal said.

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## Justice Suggests Cary Actions 'Sabotaged' Case

By Connie Winkler  
CW Staff

NEW YORK — IBM Chairman Frank T. Cary's visit with Sen. Edward M. Kennedy and his letter to President Carter last year could be "political sabotage of this lawsuit," according to Robert J. Staal, who heads the government team in the U.S. vs. IBM antitrust trial.

Staal suggested this theory in response to IBM counsel's objections to questions about the visit and letter during Cary's deposition, now in its second week here. IBM lawyer Thomas D. Barr routinely objected that Staal's questions had nothing to do with the coming cross-examination, for which the deposition is in preparation.

For the last several months, the government has argued that IBM is waging a propaganda and media campaign to present its side of the case. Both Kennedy and Carter had criticized IBM for delaying the case — Carter in a Law Day 1978 speech in San Diego and Kennedy before the Computer and Communications Industry Association. Cary said he answered Carter in a letter which was shown only to the President after an intervening phone call to Cary from a White House lawyer.

"I wrote . . . to inform him he was misinformed," Cary said.

Cary met privately with Kennedy in a Washington hotel suite last fall at the time when Kennedy was chairman of the Senate Subcommittee on Antitrust. The meeting was to tell Kennedy "how matters looked from our point of view," Cary said.

Kennedy has since moved up to the chairmanship of the Senate Judiciary Committee over the Antitrust Subcommittee, and his chief legal side is David Boies, formerly a member of the IBM defense team.

Cary told Kennedy that statements attributing the delay in the case to IBM were incorrect and that IBM was anxious to get the suit over, especially when so many of the private antitrust lawsuits against IBM had been resolved.

### Other Exchanges

Although the deposition questions are covering most of the issues and events in this mammoth lawsuit, the most lively exchanges have come over contemporaneous issues:

- IBM "may" get into the voice communications business, which "might" entail the use of satellites, Cary said. All IBM would have to do would be market PBX switchboards in the U.S., something it already does in Europe, Cary said. However, the chairman said, IBM has no plans to sell PBXs here.

- AT&T's data processing business — specifically the Dataspeed 40 terminal and Advanced Computer System (ACS) program — should be removed from the protection of a regulated monopoly, according to Cary.

"The marriage of communications and data processing is going to make each industry more competitive," he said about removing the regulated protection from AT&T. "I think competition is in the national interest."

## Stanford 'B School' Considering Cary

By Jeffrey Beeler

CW West Coast Bureau

PALO ALTO, Calif. — IBM Chairman Frank T. Cary is rumored to be among the candidates being considered to replace the outgoing dean of Stanford University's Graduate School of Business.

Cary, who has recently been giving deposition in the U.S. vs. IBM antitrust trial in New York, stopped short of flatly denying claims that he is considering leaving IBM to take the Stanford job.

"While anyone would be honored to be considered, the only plans I have are to remain as chairman of IBM," said Cary, who received a master's degree in business administration from Stanford in 1948. "I'm

not thinking beyond that."

But Cary, who is a member of the school's board of directors as well as a native Californian, did say his wife would like to return to the Bay area when he retires.

At Stanford, meanwhile, officials proved equally reluctant last week to comment on Cary's chances of becoming the next business school dean. But campus sources have privately confirmed that Cary's name has been prominently mentioned by a search committee charged with finding a successor for Arjay Miller, who will retire this July.

Under IBM's retirement rules for corporate officers, the 58-year-old Cary would have to resign his current post in December 1980, when

he turns 60.

During last week's depositions in New York City, the IBM chief heightened speculation about his retirement plans when he revealed intentions of leaving the firm in "January 1980," a year earlier than expected.

But an IBM spokesman later theorized that Cary had "misspoken" when he referred to next January as his expected quitting date.

A search committee member raised serious doubts last week that Stanford would find a suitable successor before Miller resigns this summer. If the committee member's suspicions prove correct, Associate Dean Robert Jedicke would temporarily direct the business school.

## Can you find the 3 bugs in this program?

```

00051 000051  PROCEDURE DIVISION.
00052 000052  BEGIN.
00053 000053      OPEN INPUT DATA-FILE, OUTPUT LIST-FILE.
00054 000054      PERFORM LOOP-IT UNTIL EOFSW = 'X'.
00055 000055      PERFORM LIST-DONE.
00056 000056      GOBACK.
00058 000058  LOOP-IT SECTION.
00059 000059      READ DATA-FILE AT END
00060 000060          MOVE 'X' TO EOFSW GO TO LOOP-IT-EXIT
00061 000061      ADD 1 TO REC-COUNT.
00062 000062      COMPUTE AVG = YTOT-TOT / REC-COUNT.
00063 000063      IF REC-TYPE = 'A'
00064 000064          MOVE 'OUR' TO OUT-TYPE
00065 000065      ELSE
00066 000066          IF REC-TYPE NOT = 'X' OR 'Y'
00067 000067              MOVE 'ICC' TO OUT-TYPE,
00068 000068          ELSE
00069 000069              IF REC-TYPE = 'C'
00070 000070                  MOVE 'ADM' TO OUT-TYPE
00071 000071          ELSE
00072 000072              MOVE 'UNK' TO OUT-TYPE.
00073 000073      PERFORM YTOT-CALC.
00074 000074      ADD YTOT TO YTOT-TOT.
00075 000075      MOVE CORRESPONDING DATA-REC TO LIST-REC.
00076 000076      WRITE LIST-REC AFTER POSITIONING 1.

00078 000078  LOOP-IT-EXIT.  EXIT.
  
```

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# MIS Head Wields Large Amount of Authority

(Continued from Page 1)  
directing the movements of both personnel and hardware while his subordinates in the trenches carry out his commands.

## 'New Breed' of Managers

By his own admission, Lustig typifies the so-called "new breed" of DP manager, a group of computer professionals who entered the industry during the 1950s and who have risen to senior levels of corporate management.

In Lustig's view, the trait that most clearly distinguishes the new-breed managers from the rest of their peers is their ability to think and talk both like a computer technician and a seasoned businessperson.

Members of the new breed can juggle cycle times and profit-and-loss statements with equal facility. They typically report to, and can establish a business-like rapport with, top general management. They command fat salaries befitting their lofty status, and they must bear the responsibility for vast MIS resources requiring careful, professional management.

If Lustig's description is correct, the "new breed" label fits him like a freshly pressed uniform. As Occidental's chief MIS administrator, Lustig heads a department that develops corporate applications and provides central DP services not only for an \$8 billion-a-year oil company, but also for two affiliates — a coal mining outfit and a chemical producer.

This year, he will manage a \$65 million budget and a 900-member staff, and he typically reports to the vice-presidents for both finance and manufacturing at all three affiliated firms.

## Central Control, User Latitude

Lustig scorns the typical view of the DP department as a mere service organization and the DP manager as a computer room caretaker who simply reacts to user requests for applications. Rather, he likes to think of himself and his department as a catalyst, an initiator with three main goals: to assess business operations, identify decisions that lack appropriate support and pro-

pose policy and procedural changes to improve corporate operations.

Under Lustig's direction, Occidental's corporate MIS department has maintained tight central control over all systems management and operations, while giving each of its user departments wide latitude to plan and implement its own applications.

At present, the corporate MIS staff is devoting most of its attention to strengthening systems management at Occidental's central computing site here. That effort, however, marks just one phase of the firm's evolving DP strategy. Eventually, Lustig said, Occidental plans to distribute its systems management responsibility among its various user departments, just as it has already decentralized most of its applications planning and development.

In short, Lustig has devised and begun implementing a long-term battle plan with well-defined objectives for both his staff and facilities.

Unfortunately for Occidental, unity and coherence have not always characterized the firm's MIS planning. When Lustig joined the company four years ago this month, "there was no clear MIS policy," he recalled. "Everyone was moving in different directions." Corporate management wanted tight central control over systems operations, while the various user departments pushed for increased DP autonomy.

Lustig eased the dissension by instituting an MIS plan drafted with an eye to both the corporate and the divisional levels. Under the plan, each of Occidental's user departments would have to assess its business operations annually and then, based on that assessment, submit a report outlining its systems goals for the coming year. The corporate MIS department, meanwhile, would retain responsibility for quality control "to ensure that developments were being carried out in a professional way," Lustig explained.

Later, the corporate MIS director quadrupled the level of service to Occidental's two 8M-byte IBM 3033s and launched a campaign to recruit employees with enough skill and moti-

vation to implement his DP policies. He even asked the company president to attend a week-long computer science crash course — and the president agreed to go.

"DP managers usually don't send their company presidents to school," Lustig admitted. But then, Lustig has never been one to hew blindly to convention.

## Climb Up the Ladder

Lustig said he began his DP career "almost by accident" in 1957 while still a senior at Fordham University, where he earned a B.S. degree in philosophy and sociology. Following a routine interview at Fordham's student placement office, he met the systems group head for Prudential Insurance Co., which at the time was busily trying to hire operators and other technical employees for its computing center in Newark, N.J.

Prudential had been experiencing great difficulty in training its computer room personnel, and the systems group head was convinced that, with intensive instruction, he could turn a callow college graduate into a qualified technician in just six months rather than the usual break-in period of two to three years. Lustig expressed an interest in the job, visited the Prudential site and, shortly after graduation, went to work as a computer room trainee.

Two years later, after holding a suc-

cession of computer-related jobs, Lustig left Prudential to join Mobil Oil Corp. as a systems analyst. During his 12 years at Mobil, he again worked at assorted DP jobs as he advanced steadily from project leader to head of communications and business systems development and finally, in 1966, to manager of the firm's corporate communications department.

From Mobil, Lustig then went to the Associates Corp. of North America, the financial division of Gulf & Western, Inc. As president of Associates Corp.'s computer services company, he oversaw the installation of an on-line control network encompassing some 900 branch offices in both the U.S. and Canada. He continued in that position until 1975, when he assumed his current job.

Although the 12 years at Mobil proved particularly crucial to his professional development, the 43-year-old Lustig has apparently gained useful management skills in every step of his climb from "accident" to Occidental. "All the way through my career, I've had to deal with one major challenge after another," he explained in an accent betraying his New York City origin. "After you've been on the job for a while, you realize you've done all this before. So you do it better the second time, and each time the challenge gets a little bigger and a little more difficult."

# DP No Help in Earthquakes

(Continued from Page 1)

Jose jolted Silicon Valley and neighboring territories with a shock wave measuring 4.8 on the Richter scale. Earlier, on April 27, a similar quake registering 4.3 swept outward from nearby Burlingame — again without warning.

All this unforeseen seismic activity seemed almost to spite the NCER's earthquake prediction efforts, but Chief Physicist Peter Ward made no apologies for his staff or equipment. Earthquake forecasting, he explained, is still an infant science.

"Although we've had some success in forecasting quakes, we're still probably a decade or several decades from a proven earthquake prediction system," he said.

The forecasting problem is particularly acute for moderate tremors because their early warning signs are usually subtle and seldom become evident more than a few hours before the quakes hit. With severe shocks, by contrast, the seismic foreshadowings are usually much more pronounced and appear long before any violent activity begins.

Despite these difficulties, computer-aided earthquake prediction efforts continue at the NCER, which is affiliated with the U.S. Geological Survey.

The center's forecasts begin at some 120 Bay area monitoring stations which use underground sensors to detect even the minutest seismic activities. If an ongoing pilot project proves successful, the remote monitoring stations could someday collect all their geological data with microprocessors, which the NCER's staff here could then poll automatically.

For the time being, however, the center depends mainly on telephone and

radio to communicate with its field locations.

From the remote monitoring stations, raw seismic data goes to two 64K-byte Data General Corp. Eclipse S/200s or to a 64K-byte Control Data Corp. 1700. Because of the high density of their collected data, the NCER staff records most of its field measurements in analog form. The two S/200s and the 1700 then convert the analog measurements into digital form.

Aided by another 64K-byte 1700, the three CPUs also operate on-line with the remote monitoring stations to perform computations that reveal a Bay area quake's exact location, its intensity and its "personality" traits like the speed of its shock waves and the amount of energy it releases.

Among their other functions, the two S/200s connect to a Tektronix, Inc. 4014 printer/plotter, which produces numeric output such as tables of seismic readings and graphic output such as earthquake maps and plots of underground shock waves.

Other machines involved, or soon to be involved, in the NCER's computations include a 64K-byte Digital Equipment Corp. PDP-11/34 and two DEC 396K-byte PDP-11/70s, which are currently under development here. For large-scale number-crunching jobs like seismic modeling, the center relies on a CDC 6600 and a 7600 at the University of California seismographic station in Berkeley.

Together, Ward explained, this large array of computer hardware is helping NCER staffers assemble vast quantities of seemingly unrelated seismic data and could someday reveal useful patterns in the geological activity deep beneath the earthquake-prone Bay area.

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# Can Inspect, Correct Records Law Drafted Extending the Insured's Rights

By Marguerite Zientara

CW Staff

MILWAUKEE — A model privacy protection law giving insurance customers the right to inspect and correct largely computerized personal information records has been drafted by a 10-member advisory committee to the National Association of Insurance Commissioners (Naic), headquartered here.

Intended to be introduced by insurance commissioners in state legislatures around the country, the model legislation has been in the mill since December 1977.

The model bill, created in response to the ideas contained in the 1977 report of the U.S. Privacy Protection Study Commission, still faces possible major revisions and is not expected to be ready for introduction until at least December, according to David Brummond, counsel to the Naic task force that initiated work on the bill.

## The Bill's Provisions

Now in its sixth draft, the bill prohibits insurers from using "pretext interviews" to obtain information about an individual in connection with an insurance transaction. A pretext interview is defined as an interview in which the interviewer pretends to be someone he is not, pretends to represent someone he does not represent, misrepresents the true purpose of the interview or refuses to identify himself upon request.

In addition, the law contains a section calling for the notification of the applicant or the insured of any intention to collect information about him from third parties. That section also dictates that the insurer must indicate if any of the information gathered will be disclosed to other third parties and that a right of access, correction and amendment exists with respect to the information.

Furthermore, upon request, the applicant or the insured must be told the types of personal information that may be collected, the techniques used for collection, the types of information to be disclosed to third parties and the possible identities of these third parties.

In requiring or inducing any person to sign a statement authorizing the disclosure of personal information about him, the statement must be in plain language, dated and specified as to the types of persons to whom information will be disclosed. It also must detail the nature of the information to be disclosed and specify the purposes for which the information will be used and must clarify for how long the authorization is valid.

If any properly identified individual inquires in writing what information an insurer holds about him, the insurer must within 30 days apprise the person of the "nature and substance" of such information and must permit the individual to see and copy the information, the bill states.

In addition, the insurer must state the identities of persons to whom such information is routinely disclosed, according to the model bill.

Within 30 business days from receipt by an insurer of a person's request to correct, amend or delete any personal

information pertaining to him, the insurer must either make the change or notify the individual of its refusal to make the change, the reasons for the refusal and the individual's right to insert a statement into the record indicating the request for a change.

In the case of an adverse underwriting decision, an insurer must inform the applicant in writing of the specific reasons for the decision, except in the case of medical record information which may be disclosed through a "medical professional." The insurer also must inform the adversely affected applicant of his rights of access, amendment or deletion of personal information in the case of such a deci-

sion, according to the model law.

Moreover, no insurer may inquire whether an individual has had previous adverse insurance decisions against him, nor may an insurer base any decision on such a previous action.

While similar privacy protection measures have already been enacted by Aetna Life & Casualty [CW, Jan. 15] and are slated to go into effect at Metropolitan Life Insurance Co. by July 1, many insurance firms have reportedly resisted the commission's recommendations. One reason for such resistance is undoubtedly the cost involved. While Aetna's customer response to the plan has been low, the company still regards the program as "expensive."

sive."

The bill's proponents, however, claim that while there may be an initial implementation cost to change existing recordkeeping practices, there would be "no long-term cost impact," Brummond said. In any event, the bill stands a good chance of ultimately becoming law around the country, since it is "a good consumer-oriented bill that doesn't cost the legislature anything, and in today's world I think it's a good concept," Brummond reasoned.

The Advisory Committee that drafted the bill includes consumer representative Robert Ellis Smith, publisher of the *Privacy Journal*, and nine insurance industry representatives.

(Advertisement)

## How to increase productivity in a COBOL shop...for \$25

When you think of it, the programming done in most COBOL shops is pretty haphazard. In general, programs are coded without ever being designed, so they have no structure. Program documentation (if there is any) is likely to be incomprehensible. Few programs are coded in an understandable style. And testing and maintenance are often a shambles.

As you would expect, these practices are reflected in programmer productivity. In a study done in 1965, for example, the average COBOL programmer was shown to produce only 10 to 12 lines of tested code per day. What's worse, a study done in 1975 showed no improvement. In other words, we have been stuck for ten years at an incredibly low level of productivity.

Since the mid sixties, however, the techniques of structured programming have promised a way to improve productivity. In one experiment, for example, programmers who used structured programming produced from 35 to 65 tested lines of code per day. That's a 300 percent or more increase when compared with the results of unstructured projects. Another study showed an increase in productivity of 77 percent or more when the techniques of structured programming were used.

**"My project manager wanted me to learn structured programming, so I read your book and the first structured program I wrote, albeit simple, ran the first time, like a champ!"**

Unfortunately, few companies today are benefiting from structured programming. Only about one-fourth of the computer installations claim to be using structured techniques at all. And I know that many of these companies use the techniques far less than they would care to admit...and with results that they couldn't brag about. In short, though the theory promises much, no one has developed a practical method for applying the theory...until now.

Because now I'm happy to announce two books on structured programming that I think will have a major effect on programmer productivity. The first is a training textbook called *Structured Programming for the COBOL Programmer*. The second is a reference manual called *The Structured Programming Cookbook*. Both were developed by Paul Noll, one of the leading COBOL experts in the country.

### What the textbook does

Like other books on structured programming, Paul's textbook presents the theory behind the structured programming movement. Unlike other books,

however, Paul's book presents a method for applying the theory that works...a method that is complete, logical, and practical.

Perhaps the major shortcoming of other books and courses on structured programming is the treatment of program design and documentation. In general, these subjects are either given academic treatment or are omitted altogether. In contrast, Paul gives specific guidelines for designing and documenting programs with the emphasis on practicality.

In chapter 2, then, you'll learn how to design a structured program. You'll learn the four steps for creating structure charts...what modules should go at what level...six things to watch for when refining structure charts...and much more.

In chapter 3, you'll learn how to document the modules within the structure chart. Among other things, you'll learn how to use pseudocode...when to use COBOL names and words in the documentation...and what things you should think about and watch for as you document the modules.

After you have mastered structured design and documentation, chapters 4, 5, and 6 show you how to use the other techniques of structured programming. These techniques include structured coding, top-down testing, structured walkthroughs, chief-programmer teams, and development support libraries.

### What the cookbook does

One of the problems with training is that it too often isn't applied after the programmer returns to his job. That's why we created an easy-to-use reference book that will follow the programmer back to his desk.

**"Both books have stopped the re-invention of programs and have helped to promote the sharing of code and ideas."**

Section 1 of this book is called Standards and Guidelines. It summarizes the principles of the text for each phase of program development. So if a programmer can't remember the steps to follow when documenting a module or how to use compound conditions in a COBOL IF statement, he can use the cookbook to refresh his memory in a hurry. From the manager's point of view, this section is an instant standards manual for a structured programming shop.

Sections 2 and 3, however, are a more important aid to productivity. They present the complete solutions for four model programs. Since structured programming encourages you to develop similar programs in similar ways, this means that you won't have to develop each new program that you write from scratch. When Paul Noll develops an update program, for example, he finds that he can use the structure chart, some module documentation, and even some of the COBOL code from the model update program in the cookbook. Imagine how this can increase a programmer's productivity!

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S-4

**Dear Mike:** Send me the books I've indicated so I can evaluate Paul's methods for myself. If I don't discover an exciting, new way to develop structured COBOL programs, I'll return the books for a full refund. I understand I will be billed the appropriate price plus freight (plus sales tax in California).

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# Don't Replace Your 3270s Without Taking The Trivex Target Test.

# Destroy Your EFT Cards, Congressman Urges

By Jake Kirchner

CW Washington Bureau

WASHINGTON, D.C. — Consumer protection in electronic funds transfer (EFT) transactions is so negligible that EFT users should immediately destroy their electronic banking cards, Rep. Frank Annunzio said recently.

The Illinois Democrat's warning was delivered at the close of hearings held by the House Banking Subcommittee on Consumer Affairs. The panel, chaired by Annunzio, is considering legislation to amend the 1978 EFT Act.

Representatives of the Federal Reserve System and the American Bankers Association (ABA) testified that one amendment proposed by Annunzio — moving up the act's effective date from May 10, 1980 to Sept. 10, 1979 — would not allow enough time to draft and implement regulations required under the original legislation.

Annunzio countered that until the legislation is in effect, "consumers will not be adequately protected... Until that time they are strapping themselves in a financial electric chair if they use electronic banking services."

## Fed Needs More Time

Nancy H. Teeters, a member of the "Fed's" Board of Governors, told Annunzio's subcommittee the Fed will need until December to finalize regulations for implementing the new law. Proposed regulations were issued two weeks ago, and the Fed will allow two 60-day periods for comments.

Teeters explained that this amount of time is needed because of the complexity of the regulations and EFT in general. The possibility exists that hundreds of comments will have to be processed and considered before final regulations are drafted, she said.

Congress could move up the effective date of the law to early 1980, she suggested, but that would give the banking industry very little time to prepare for the new regulations. That point was echoed by Eugene M. Tangney of the ABA, who said, "Industry can only move to implement compliance after it knows how the [Federal Reserve] Board will interpret the complexities of the statute."

A bank "cannot initiate detailed computer software changes until the published regulations define the requirements... Smaller banks would be the most vulnerable to noncompliance if the effective date is premature," he said.

Approximately 15% of the 13,000 banks with less than \$100 million in assets have installed computers. Significantly, however, most of these banks that have installed computers have little or no in-house resources to effect required computer software changes.

## Rely on Packages

"Instead, they rely on application packages supplied by vendors or other outside resources; both approaches usually require extended lead times to effect computer system changes," he said.

Of banks with less than \$100 million in assets, 75% rely on external DP services to some degree, he noted. "Again, these banks are subject to delays associated with resources not under their management control and would be vulnerable to noncompliance."

Annunzio said it's "very disgusting"

that every time Congress tries to do something for the consumer, there are "a thousand damn good reasons" not to. When the banking industry wanted a provision for notifying all customers of their rights under the EFT Act deleted from the new law the industry needed "only one hour" to consider the change, he said.

Banking representatives estimated the notification requirement would cost the industry as much as \$1 billion. That section of the law was repealed by Congress earlier this year at the request of the industry [CW, March 19].

Congress was willing to make that change, Annunzio said, because it recognized that the law, passed at 4 a.m. on the final legislative day of the last Congress, slipped through without

needed changes because of time constraints.

Annunzio was particularly critical of Fed regulations for a section of the law already in effect concerning consumer liability in EFT transactions. In promulgating the consumer liability regulations, the Fed "expressly contradicted the statutory notice language" in the EFT Act, he said.

The original legislation stated that a consumer must notify a financial institution of a lost or stolen EFT card two days after receiving a periodic bank statement that showed unauthorized use of the card or be liable for up to \$500 in unauthorized withdrawals from his account. Congress clearly phrased the two-day provision to mean that a notice must be mailed by

the consumer within that time, Annunzio said. If those conditions are met, the consumer's liability is limited to \$50.

## Mail Ineffective

The Fed regulation, however, says the two days apply to when the notice is received by the financial institution. Because of the time involved in mail delivery and because the board provides that written notice will not be effective until receipt, Annunzio said, "a consumer is invariably going to be forced into the \$500 liability."

Both Teeters and Tangney suggested revising that section of the law so that the consumer could give a telephone notice followed by a letter.

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## EFT Not Curbing Check Use

NEW YORK — Wider acceptance of electronic funds transfer (EFT) services has not reduced the volume of check transactions.

In fact, consumers who use EFT services tend to write more checks than individuals who shy away from these services, according to a study by Payment Systems, Inc. (PSI), a research and consulting firm here.

During the past year, PSI surveyed 1,500 consumers nationally and a total of 2,000 individuals from five metropolitan areas regarding their payment habits and use of fi-

ancial services. It found that people substitute credit cards for cash transactions and also write more checks than individuals who don't use credit cards. Other findings:

- Employees cash more checks when their salaries are deposited directly into their bank accounts.
- Preauthorized charges to bank accounts and telephone bill payments increase checks.
- Automated teller machines (ATM) have not yet affected check-writing behavior, except at the point of sale.

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## User Wins \$401,690 From Burroughs Corp.

By Ann Dooley  
CW Staff

TUCSON, Ariz. — A superior district court here has ordered Burroughs Corp. to pay \$401,690 in damages to Kalil Bottling Co. because the former user's processor consistently made errors that were never corrected by Burroughs. But the Tucson bottler George Kalil doesn't expect to see the money soon because Burroughs intends to file an appeal — a move that could tie up the case for two more years.

The suit has been in court since 1973, when Kalil sued Burroughs over the performance of its E6000 system, purchased in 1969. The case became bogged down by legal arguments and did not reach a jury until last March. The four and one half week trial ended April 11 with the award of damages to the bottler.

Kalil purchased the E6000 because he planned to increase the size of his soft drink canning company and wanted to automate its business functions. Burroughs was chosen over three other companies because it seemed the most knowledgeable, Kalil said.

But problems with the E6000 started immediately. The bottler was told that the errors resulted from debugging problems, but the problems didn't clear up and in fact grew worse, Kalil said.

The machine frequently broke down — once for as long as 10 days — and recorded downtime reached 27% one month. Burroughs service people came regularly, but they couldn't do anything with the system, Kalil charged.

At one point, they even instructed Kalil's operator to try lifting the console two inches off the desk and dropping it before calling them for help, he said.

The faulty computer produced incorrect paychecks, inaccurate reports, addition errors and chewed-up ledger cards; two programs could never even be implemented on the machine, he said. Employees spent 10 to 12 hours, sometimes six days a week, trying to get their jobs done, and key people spent all their time preparing manual reports.

One month, accounts were so confused that no statements were sent out, which did nothing for the company's image — or budget, Kalil stated.

### Machine 'Cannibalized'

In 1971, Burroughs loaned the company another E6000, but that machine didn't work any better, Kalil said. When one was operating, the other

would be down and programs couldn't be switched from one to the other.

Finally, the second E6000 was cannibalized to provide parts and a third was brought in, but nothing helped, he said.

At one point, the company almost went into receivership, partly because of the accounting confusion, Kalil said. Internal Revenue Service people came to look at the company's books, but even they couldn't figure out the accounts, Kalil claimed.

By this time, Burroughs had quit producing parts for the system and was charging a service charge on the second machine when all it was doing was helping the first one, Kalil said. "In desperation, I had no alternative but to sue," he recalled. "I don't recommend suing except as a last resort, but I tried every other avenue."

"The E6000 line was probably on its way out when we bought it, but Burroughs never told us that. I don't think it ever sold many of them anyway, perhaps because something was wrong with the whole line," Kalil stated.

The E6000 consisted of an input console, a card reader and an electronic board. "We ended up having three consoles and two of each of the other major parts — all of which were cannibalized and are now all dead," he said.

It would be impossible to determine how much the whole episode has cost him, Kalil said. The system itself cost \$40,000, but court costs, overtime and damage to the company's reputation are also factors. "Now I wish I'd asked for more money in damages," he said.

Burroughs would not comment on the court decision except to say it did not agree with the verdict and plans to file an appeal. The system was more successful for its other users, but the company generally regards the system as "ancient history," according to a spokesman.

The E6000 was a bridge between the electromechanical era and fully computerized systems such as the Series L minicomputer, which was the E6000's successor, he explained.

Although Kalil's first experience with automation was a disaster, he decided in 1976 that the company still needed an automated system and purchased a Digital Equipment Corp. Datasystem 354 with a 300 line/min printer and a 56M-byte disk drive. "We've had no problems with it," Kalil said, adding that his company, has started to gain a better reputation with its customers.

# California Closer to Adoption of DP Crime Bill

By Jeffrey Beeler

CW West Coast Bureau  
SACRAMENTO, Calif. — California recently came one step closer to passing its own version of the Ribicoff computer crime bill when the state Senate's Judiciary Committee approved amendments aimed at clarifying the legislation's intent and phrasing.

The recent hearings marked the second time that Sen. Lou Cusanovich (R-Woodland Hills) had presented State Bill 66 before the committee chaired by Sen. Jerry Smith (D-San Jose).

During the first hearing last February, Smith ordered Cusanovich and his associates to redraft parts of the proposed law after critics testified that unclear wording in the legislation could result in severe criminal penalties for relatively minor and harmless offenses [CW, March 12]. Members of the California DP management office completed the recommended revisions on April 23, and little more than a week later Cusanovich presented an amended version of S.B. 66 before Smith's committee.

Seated beside Cusanovich at the hearing were computer law and crime experts Susan Nycum and Donn Parker, both of whom came prepared to testify in the bill's defense. But neither Nycum nor Parker got a chance to speak during the hearing because the committee, weary from a long day of legislative wrangling, accepted the revised bill after only about a five-minute debate.

The proposed law now goes to the Senate's Finance Committee, which will consider S.B. 66's fiscal implications in hearings slated to take place in June.

## 'Malicious' Use Outlawed

Introduced early last December by Cusanovich, S.B. 66 is the California equivalent of S.1766, the federal computer crime bill co-sponsored by Sen. Abraham Ribicoff (D-Conn.) and currently undergoing debate in the U.S.

Senate.

If enacted, the amended form of S.B. 66 would empower the State of California to prosecute individuals who "maliciously" use computer equipment for attempted theft or fraud. The bill would also outlaw malicious destruction or alteration of computer hardware, programs, data or networks.

Earlier versions of the proposed legislation would have forbidden "knowing and willful" computer-related misconduct and would have banned "unauthorized" users from disclosing or altering programs "with intent to cause harm." But at the insistence of two programmers who testified last February in opposition to the bill, Cusanovich and his associates dropped the phrases "unauthorized" and "with

intent to cause harm" and substituted "malicious" and "knowing and willful."

During the first Judiciary committee hearing, both programmers — John James of the Berkeley, Calif.-based Cetus Corp. and John Taber of IBM's Santa Teresa, Calif., laboratory — urged clarification of S.B. 66's language. Unless terms like "unauthorized access" were defined more specifically in the bill, they warned, individuals could someday face criminal prosecution for "offenses" as piddling as using their firm's computer to play tick-tack-toe.

The pair also criticized S.B. 66 as unnecessary because, they claimed, almost all crimes involving computers are already covered under existing

statutes for theft, fraud and vandalism.

At the second hearing last week, Taber reiterated his belief that the proposed law is unnecessary. But he did voice satisfaction that the bill had since been amended to limit criminal liability to "malicious" acts only.

"At least I know now that I won't go to jail for playing tick-tack-toe," he told Judiciary Committee members.

Under provisions of the newly revised bill, an individual convicted of a computer crime in California would face a \$2,500 to \$50,000 fine, a one- to nine-year prison sentence or both. Those penalties mark a departure from the preamended bill, which called for a two- to four-year prison sentence, a flat \$50,000 fine or both.

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5-year basis. We'll install the system, and, practically without exception, you'll be up and running 24 hours after our people walk into your computer room. We train your operators, and we'll fine-tune SAMS to fit your specifications. Then you simply run it as often as you want, at no additional cost.

#### A proven system

"Address matching for carrier-route coding simply isn't a commodity; you can't buy it by the pound. It's actually a form of geocoding—the science of matching or merging geographic codes from one file with geographic codes from another file. And it's as much an art as it is a science. To exceed the 95% accuracy the Postal Service demands requires a tested geocoding system and experienced people. Urban Data has ten years of geocoding experience. SAMS has processed over a billion records, and our people have run geocoding jobs in every state and every SMSA in the country. Most critical, SAMS is a proven system that's already installed and running at a number of companies, handling a variety of geocoding jobs.

#### Greater flexibility and control

"If you use a service bureau for carrier-route coding, you'll probably have to use the carrier-route directory they offer, and that limits your flexibility right from the start. SAMS, in contrast, because it is a universal geocoding system, is compatible with every available directory. You can use whatever directory you prefer. SAMS is the only matching system that can give you that kind of flexibility. Plus, because SAMS is a true multi-purpose geocoding system, you can use it for zip coding and 1970 or 1980 census tract coding.

"With SAMS installed in-house, you also won't have to send your mailing list out of your shop for carrier-route coding. You keep the list and the schedule under your control.

#### Superior accuracy

"In view of the fact that you stand to forfeit your discount if your

matching isn't 95% correct, achieving a level of accuracy you've never had to worry about before is going to be key to your success in carrier-route coding. A conventional match-code-based system may not be accurate enough to handle carrier-route coding and, in fact, may well result in ambiguous matches. And a match-code-oriented system probably will reveal little about rejected or non-coded records.

"SAMS doesn't use match codes. Instead, it first reformat the entire record, then utilizes every character in the address, city, state, and zip portions of the record to establish a match. Because the whole record is used, SAMS more easily handles 2-letter transpositions, extra characters, missing characters, common spelling errors, etc. As a result, SAMS achieves exceptionally higher match levels, but the error rate is virtually zero—which is where it must be for carrier-route coding.

#### Maximum reject utilization

"Because SAMS looks at every character during the match process, you get more value from the records that don't match. You can identify exactly which records were rejected and why, and then you can use that information to update and adjust your directory, or correct the records. As a result, productivity will improve with every mailing.

"For many high-volume mailers, I think doing it yourself is absolutely the right approach to Postal Carrier Route Coding. If you want more information on SAMS, just contact me, Max Eveleth, at Urban Data Processing, Inc., 20 South Avenue, Burlington, MA 01803, (617) 273-0900."

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# TEXAS INSTRUMENTS.

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# Data 79 Attracts Crowd of 4,300

By Tim Scannell  
CW Staff

TORONTO — Just a stone's throw away from baseball's Exhibition Stadium, the Sports and Hockey Halls of Fame and a deserted amusement park, the Data 79 conference was held here recently at Exhibition Place, drawing a record crowd.

Approximately 4,300 DP enthusiasts took part in the three-day event, easily surpassing last year's attendance figures of 3,500. Although the main exhibits and conferences were headquartered in the exhibition area's Queen Elizabeth Building, the luncheon conference were held in the convention facilities of two other hotels.

## Robots Missing

Conspicuously absent from the show were the robots, or remote-controlled automotons, that usually blip and squeal across every major exhibit floor, competing for the precious attention of the attendees. However, Honeywell Ltd./Incoterm Corp. did supply their own form of computer-generated entertainment by enlisting the aid of a cartoon-like figure, shown on a television screen, that traded quips with the DP executives and Canadian students.

Cableshare Ltd. demonstrated a microcomputer-based intelligent concentrator that reportedly supports Canada's Datapac and Infoswitch communications networks, as well as the U.S. Telenet Communications Corp. and Tymnet Inc. Systems. The X.25-compatible device permits packet network access for asynchronous devices and can accommodate four, eight, 12 or more ports at speeds up to 9,600 bit/sec, a Cableshare spokesman stated.

Basically a turnkey system, the X.25 concentrator's hardware and software components can be tailored to user requirements and can work with both EIA's RS-232C or 20mA terminal interfaces. The machine's hardware is manufactured by Digital Equipment Corp., and Cableshare provides software installation and support.

The four-port concentrator costs about \$6,800 from the firm at 20 Enterprise Drive, London, Ont., Canada N6A 4C2.

## ZBK Releases

ZBK Associates, located in Montreal, introduced a telecommunications network manager geared to increase the efficiency of IBM-compatible networks and increase traffic-handling capacities, a spokesman said. The Z4271 can be used in either point-to-point applications or in mixed networks of 3270-type and 3780-type communications protocols.

The network manager is completely transparent to the host computer's hardware and software; it is available in a monobloc or tandem configuration. Options include up to eight host lines and two telecommunications lines; line speeds up to 38K bit/sec; data encryption and decryption facilities; and message-switching between remote stations, the company representative noted.

The Z4271 costs approximately \$3,400 to \$11,050, depending on the user's system and the unit's configuration.

ZBK also unveiled plans to market an advanced cluster controller in Canada sometime in September. The Z3274 will be an alternative controller for 3270 clusters that will handle up to 32 directly attached devices and 24 RS-232C machines.

The cluster controller will reportedly be driven by the firm's network manager and will communicate in a full-duplex compressed data mode, even when the host computer is functioning in a half-duplex, bisynchronous fashion.

Although there are no definite plans to market the cluster controller in the U.S., the spokesman admitted that ZBK is seriously considering the possibility. Presently, the Canadian price for the device is set at \$4,000.

Finally, the ZBK spokesman announced plans to filter the company's Z3780 data communications terminal into the U.S. market "sometime in the future." The terminal is a medium-speed device incorporating multiple print buffers, the ability to operate in Binary Synchronous Control (BSC), Synchronous Data Link Control (SDLC) or X.25 protocols and in line speeds up to 9,600 bit/sec on dedicated or multidrop communications lines.

Currently, the unit sells for \$11,000; no U.S. price has been set.

Hewlett-Packard (Canada) Ltd. displayed a menu-driven software package for its 2647A graphics terminals that produces overhead slide transparencies on an optional graphics plotter. The software is currently included with the terminal and offers full-editing capabilities, three character fonts, selectable character sizes and automatic color selection.

HP did not have any prices available for users who had purchased the 2647A prior to the software's introduction and might want to add the transparency feature to the unit.

Two new printers were shown at the Centronics Data Computer Corp. booth. The first, the Model 753, is a proportional spacing, right-

justification dot matrix printer capable of speeds up to 130-to-150 char./sec.

The unit automatically compensates for character size differences and was designed for word processing applications, Centronics said.

The U.S. price for the Model 753 is \$3,215.

The second printer, the Model 791 demand document machine, is still in the prototype stage and won't be available until September.

The Model 791 has a print speed of 60 char./sec, prints 80 col/line and incorporates LSI technology. Optional features include an audio alarm, interface adapter, elapsed time indicator and extra character sets.

The approximate price for the unit will be \$3,000 in U.S. dollars.

Both Centronics printers are RS-232C compatible and can be ordered from the firm in Hudson, N.J. 03051.



CW Photo by T. Scannell

Exhibitor at Data 79 makes final adjustments to product.

Finally, Valtec Corp. of West Boylston, Mass., made the new products lineup by introducing a video, voice and data multiplexing video link. The VS-100 reportedly increases the signal-to-noise ratio and eliminates environmental interference.

With applications in cable television, data communications and fiber optics, the transmitter/receiver requires

no signal repeaters up to lengths of nearly 10,000 ft. The video link has provisions for adding on single or dual audio channels and/or data channels that provide an effective bandwidth of up to 250K bit/sec, a spokesman said.

The VS-100 costs less than \$4,000 from Valtec at 99 Hartwell St., W. Boylston, Mass., 01583.

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# DP Expected to Impact All Public Activities

By Tim Scannell  
CW Staff

TORONTO — The socioeconomic impact of computers and communications will extend beyond business and government into the informational, educational and recreational activities of the public.

In due course, citizens' opinions will be available instantaneously, and "people will be able to better deal with the issues presented to them,"

Bernard P. Charbonneau, director general of supply, Quebec Region Supply and Service Canada, said.

Charbonneau was the conference chairman here at the recent Data 79 gathering and delivered the opening address to a packed audience of DP executives, communications specialists and industry peers.

Although it may seem paradoxical, computers will probably make it easier to preserve

and ensure individual rights, Charbonneau stated, pointing to the increased avenues of communications and data retention that will be available. The proliferation of computers and data banks, however, could also constitute one of the greatest threats to human rights if there are no adequate controls.

Providing each citizen with a single, identifying number in place of the dozens of num-

bers assigned through credit cards, bank cards and other computerized identifiers would help to simplify a person's life. But it also would "make it easier for someone to check up on people," Charbonneau stated.

Although the logic of national and international data bases is quite clear, legislators fail to take this logic into consideration when making laws. Computer technology is pres-

ently governed by two standards, Charbonneau said, first, by the standards set by federal and provincial governments and second, by laws extending to competitive and common business practices.

Present provincial laws, however, don't distinguish between voice and data transmission, the chairman pointed out, and such aspects as "data rates" have governmental experts "baffled."

Governments have "a heavy role to play" in rationalizing the use of computers. Legislators must take action for the protection of sensitive data and for increased access to remote networks. They must overcome dehumanization, stimulate innovation and redefine those applications that are not in the best interest of society, Charbonneau said.

It is the government's responsibility to design alternative "computer/communications solutions" so that we can make deliberate choices rather than be constrained by the unexpected," he explained.

## Facilitated Learning

In a different vein, the conference chairman stressed the importance of computer-aided learning, especially in the primary schools. "Young kids are particularly susceptible to this type of training . . . and very, very much has to be done," Charbonneau said.

The event chairman reported that about 25% of the current teaching programs can be automated and such systems as the University of Illinois' Plato have proven helpful for slow learners. In fact, using computer-aided teaching methods, bright kids move about 10% faster than slower learners because they don't get bored as easily as in a traditional classroom environment.

Although the idea of computers in the classroom may seem "repugnant" and a step toward dehumanization, the evidence points the other way, Charbonneau said. Computers actually provide a "measure of individual attention that a student couldn't possibly get without a private tutor." Teachers, however, will always be needed to supply guidance, stimulation and discipline, the chairman said.

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Data Processing Manager  
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# Industrial Age Doomed: Toffler

By Tim Scannell  
CW Staff

TORONTO — After 300 years of existence, the world's industrial society is headed toward extinction — and computers, telecommunications and information processing are partly to blame, author Alvin Toffler said in a speech at the recent Data '79 conference here.

Addressing a luncheon audience of computer company executives and Canadian government officials, self-described social critic Toffler outlined what he called the "third wave" of historic, technological and social change that is fast developing.

Society is undergoing a critical period of disintegration, he said. The present "self-reinforcing cultural social system," or industrial way of life, no longer has a puzzle-like synchronization, the award-winning author of *Future Shock* said. Familial, social, economic and other systems are currently growing disproportionately in an "out-of-whack" fashion.

Because this social revolution is moving much faster than both the Industrial Revolution and the previous 10,000-year agricultural period did, information plays a crucial role. Decisionmakers and shakers are being asked to speed up the thinking and resolution process, while computers and machines race to supply the needed data, Toffler said.

However, although computers increase the richness of the data handled, they cannot increase the speed of the decisionmaking process itself, he said. Programmable decisions or routine activities can be relegated to a computerized device, but there is an ever-increasing number of nonprogrammable or first-time decisions to be made.

This two-level process results in a "stress and decision conflict," where one side of the brain says to hurry up with routine decisions and the other half tells the person to slow down so as not to make a mistake with first-time rulings.

## Global Standards

Reflecting on the present industrial society, Toffler spotlighted a number of standards common to all races on all points of the globe. First, he said, all industrial societies, regardless of language, are dependent on the same fossil fuels.

In addition, all of these societies lead time-dependent, synchronized lives dominated by the tight scheduling imposed by "the interfacing of machine and human systems." Even the sacred family structure is moving away from being a nuclear relationship to being a highly mobile unit, Toffler said.

Whereas the industrial wave tended to make all people live, think and react alike, "the third wave" — which hap-

pens to be the title of Toffler's soon-to-be-released third book — strives to make people different and more individualistic. There are "differentiating, centrifugal pressures in the [present] system," Toffler said, and an obvious "demassification of the marketplace ... particularly in the [computer] industry."

Japan refers to this upcoming whirlwind of information as the precursor to a "multichannel society." Paradoxically, the very reason the computer industry is flourishing — the desire for information — is also the reason for the creation of a "painful and potentially conflicting" era of change, he said.

Presently, "there is a tremendous need to exchange information as whole cultures race to maintain equilibrium."

Unfortunately, there is not always a balance between decisions flowing from the top and information seeping from the bottom of the organizational pyramid, Toffler pointed out.

The push for a "substitution of communications for [physical] transportation" will eventually have its biggest impact on family life, Toffler continued. The future may see the birth of the "electronic cottage," where every household is a fully equipped telecommunications center and actual person-to-person contact is minimal.

How would this machine-oriented lifestyle affect the people who are not electronically verbal or computer-literate? Most likely, these people will choose not to become "data sophisticates" and "will fight for their sur-



CW Photo by T. Scannell

Alvin Toffler

vival," Toffler predicted. To avoid a division between computer people and "outsiders," efforts should be made to create a more "natural language" for computer communications.

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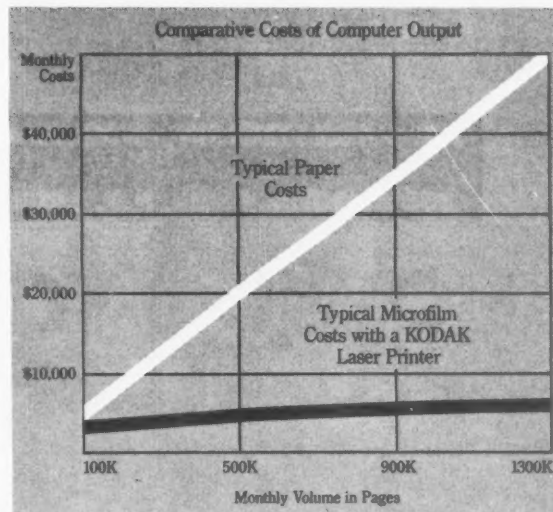
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# NCC Miniconferences to Cover Legal Issues. . .

NEW YORK — Computers, law and public policy will be covered at the National Computer Conference here in a separate four-day miniconference June 4-7.

The 14-session miniconference slated for the Mercury Ballroom of the New York Hilton Hotel has been organized by William Wewer, an attorney with the law firm of Sutherland, Asbill & Brennan of Washington, D.C.

The program is aimed at corporate counsel, private attorneys, upper man-

agement in the information industry, government officials and others interested in legal and social issues relevant to DP, according to Wewer. A special feature will be a conference plenary session Wednesday, June 6, during which Rep. Charles Rose (D-N.C.) will address issues involving computers and public policy.

Major program areas will include government regulation of the information industry, the impact of international law and regulation on DP, the

use of computers in the practice of law and by the federal government and other legal issues.

Government regulation of the information industry will be examined in five sessions, beginning with a double session on regulation vs. antitrust law in promoting competition in the marketplace. Among additional topics are regulatory and legislative considerations affecting computer communications and information privacy, as well as related issues involving computer software including patent and copyright protection and state and federal tax treatment.

The miniconference will open Monday afternoon, June 4, with a double session on "Regulation or Antitrust: Competition in the Computer/Communication Marketplace," chaired by Edwin B. Speivack, a partner in the firm of Cohn & Marks of Washington, D.C.

The program will continue Tuesday morning with two sessions covering communications and the use of computers by the federal government. Prominent speakers will address the variety of ways in which computers are used in all three branches of the federal government, including the promotion of public policy decision making, the expedition of the flow of legislation and the streamlining of clogged judicial dockets.

The second session, "Evolution of the Computer Communications Market in a New Technological Era," will be chaired by L. Dan O'Neil, deputy director of policy coordination for the National Telecommunications and Information Administration (NTIA). Panelists will analyze domestic communications issues affecting the DP industry, including the Federal Communications Commission Second Computer Inquiry, the rewrite of the Communications Act and the impact

of new technology on the development of this law.

## Frauds and Patents

Wednesday morning's program will begin with "Conducting the Trial: Evidence in Computer Crime and Fraud Cases," chaired by Nathaniel K. Kosack, a partner in Perito, Duerk and Carlson of Washington, D.C., and formerly deputy assistant attorney general of the Criminal Division in the U.S. Department of Justice. Leading practitioners will discuss legal difficulties involved in prosecuting computer criminals.

Following this, John W. Behringer, a partner in Sutherland, Asbill & Brennan, will chair a session entitled "No Patents for Software — If So, What Now?" Panelists will review the U.S. Supreme Court's reasoning in *Parker vs. Flook*, which held that certain computer programs are unpatentable, and will examine the types of software inventions which might still be patentable.

Additional issues involving computer software will be examined Wednesday afternoon in "Software Tax: An Idea Whose Time Has Come . . . Or Gone?," also chaired by Behringer.

The miniconference will conclude Thursday, June 7. Speakers will provide an analysis of the Carter Administration's proposed privacy policy and will discuss additional domestic privacy developments that will affect not only programs and services sold to customers but may also significantly change the internal management and recordkeeping policies of the computer industry.

Complete information on NCC '79 is available from the American Federation of Information Processing Societies, Inc. 210 Summit Ave., Montvale, N.J. 07645.

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## . . . Health Care Computing, And Related Policy Matters

NEW YORK — Issues in health care computing will be covered at a miniconference June 6 and 7 at the Trianon Ballroom of the New York Hilton Hotel, concurrent with the 1979 National Computer Conference.

Sessions will focus on federal policy, state data centers, hospital information systems, clinical practice and other is-

ssues relating to the use of computers for health care, according to the American Federation of Information Processing Societies Inc., NCC sponsor.

The registration fee for this particular miniconference prior to May 15 is \$60; on-site registration is \$75. One-day registration costs \$25.

## Pioneer Day to Focus On Software, Cobol Design

NEW YORK — Although it won't feature discussions of six-shooters and horse-drawn wagons, the National Computer Conference's Pioneer Day June 6 will include sessions on the early days of computer software and will focus on the development of the Cobol language.

Aided by such veterans of language development as Capt. Grace M. Hopper, Charles Phillips and Betty Holberton, the special program — commemorating the 20th anniversary of Cobol — will discuss and describe the origins of Cobol and present the rationale

behind its formation.

Session topics will include "The Education of a Computer," "A Cobol Anthology," "The Procedure Division and The Cobol Metalanguage" and "The Data Division."

Speakers will also cover some of the controversies surrounding Cobol, the reasons for Cobol's survival and its relationship to computer science.

Additional information on Pioneer Day and on NCC is available from the American Federation of Information Processing Societies, Inc., 210 Summit Ave., Montvale, N.J. 07645.

# NATIONAL — SPECIAL LEAR SIEGLER ISSUE — INFORMER

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**INCREDIBLE BUT TRUE:**

# LEAR SIEGLER LEAKS FIRST HARD FACT

## Data System 1000 To Open Up New Ports

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★ ★ ★

## Lear Siegler Bio-Rhythms Approaching Triple High

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## Lear Siegler Philosophy: We're More Than Just A Terminal Company

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## Sky's The Limit At New Lear Siegler Production Facility

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## Garry Strohmeyer Vows, "You Ain't Heard Nothin' Yet"

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★ ★ ★

## Lear Siegler Watchers' Predictions For '79 — And Beyond

Page 41



Cathy Raftery, Data System Product Manager, seen at press conference discussing 1000 Data System. Raftery astounded reporters by actually revealing "hard news." INFORMER PHOTO

**In a surprise move yesterday, Lear Siegler caused a major sensation and released information without being pressured to do so from the outside.**

Cathy Raftery, Data System Product Manager, revealed to a stunned and disbelieving audience the 1000/4 and 1000/8 Data Systems. Why Lear Siegler

should abolish company policy of stringent secrecy at this time is not fully understood, but the *National Informer* is picking up tantalizing rumors.

Raftery, commenting on the product, said the 1000/4 and 1000/8 offer the best features of the 1000 with things found normally only on a mainframe. When asked for examples, Raftery cited increased flexibility, with a multiplexer to provide 4 or 8 ports on the basic system for eight users. She also mentioned a capacity for further expansion (and more terminals), but was purposefully vague on details.

It was plain that, if this is the rumored Project Y, it is only a part, and several reporters in the audience immediately launched probing questions in Raftery's direction. She fielded the questions with a slightly theatrical, "Project who?"

Nevertheless, it was learned that customers have their choice of incorporating either basic ADM-3A Dumb Terminal® terminals, or more sophisticated models on the 1000 Data System, such as the ADM-31 and ADM-42.

Further, Raftery revealed the 1000 Data System is programmable not only in BASIC, COBOL, and LSDL (Lear Siegler Development Language), but also has the option of BLIS/COBOL and IRIS/Business Basic operating systems.

When pressed further, Raftery seemed to hesitate, as if unwilling to give out too much information. At last, she relented and explained that the basic system consists of a 16-bit CPU, 32K (expandable to 64K), 16-bit words of dynamic RAM, Dumb Terminals, a 180 cps, bi-directional 300 Series Ballistic Printer™ and a 10 megabyte cartridge disk.

Raftery unexpectedly sped from the stage before reporters could question her further. Why, the *National Informer* wonders? Could it be that the information (Please turn to page 6, column 3)

# Regulate Canadian EFT Fast, Report Urges

By Marguerite Zientara  
CW Staff

LONDON, Ont. — The Canadian government should move quickly to regulate the burgeoning electronic funds transfer (EFT) phenomenon to prevent citizens' loss of privacy and security in their financial dealings, according to the first official Canadian report issued on the subject.

No laws presently exist to protect people from the prob-

lems associated with EFT, research project director Richard McLaren, who is a professor at the University of Western Ontario Law School, said.

In "The Challenge of EFT: Policy and Legislative Responses," commissioned by the Province of Ontario and designed to stimulate public debate on the issue, McLaren projected that personal identification numbers (PIN) may replace check and credit card

signatures in three to five years as the standard means of payment.

## Dispersed Problem

Because Canada has only a few banks with a lot of power, in contrast to the U.S., where there are many small banks and the power is dispersed, privacy problems could be potentially worse for Canadians, a consultant to the research project said.

Banks and other financial institutions that are "secretive by nature" support EFT because of its speed and efficiency, while customers are at a disadvantage because of technical and legal ignorance, McLaren said.

One of the "most disturbing facts" uncovered by the project is "that customers do give up their right to confidentiality by signing waiver clauses," the report said.

In the area of security, the report identified four potential problems in EFT systems. These include the use of a stolen access card and the appropriate PIN to activate a remote terminal, as well as accessibility of centrally stored data by bank-employed remote terminal operators.

Other security problems include possible access to the CPU by employees or outsiders and wiretapping of communications lines.

To ensure the security of EFT systems, the report recommended that an industry-government committee be established to draw up guidelines for protecting EFT data. These guidelines should cover restriction of unauthorized access to data by financial employees, division of responsibilities among employees, employee training programs and monitoring of the systems, the report said.

EFT should give the customer the same stop-payment rights now available with checks, according to the report, either by "value dating" or by allowing a transaction to be reversed within a specified number of days. "Value dating" refers to the delay of a funds transfer for a certain amount of time, a concept that unfortunately nullifies the principal benefit of EFT — speed, McLaren noted.

In EFT transactions, a card holder should have the right to assert the same defenses against the card issuer as he would have against the person who accepted the card in completing the sale, the report said.

"The consumer must know what he is getting into," the report urged. Existing laws requiring the disclosure of the cost of services and interest rates "in certain situations" should be extended to EFT customers.

A card holder should be liable for losses sustained through unauthorized use of his card only if he failed to notify the financial institution of the loss, if he kept the card and its PIN together or if he voluntarily gave both to someone, the report said.

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## Calendar

June 12, Washington, D.C. — **Distributed Data Processing**. Contact: Department J — Datacomm, American Institute of Industrial Engineers Seminars, P.O. Box 3727, Santa Monica, Calif. 90403.

June 13, Washington, D.C. — **Minicomputers**. Contact: Department J — Datacomm, American Institute of Industrial Engineers Seminars, P.O. Box 3727, Santa Monica, Calif. 90403.

June 13-14, Palo Alto, Calif. — **Second Annual Symposium on the Automated Office**. Contact: Gwendolyn Thomson, The Yankee Group, P.O. Box 43, Harvard Sq., Cambridge, Mass. 02138. Also being held June 20-21 in New York.

June 14-15, New York — **Project**

**Financing**. Contact: Advanced Management Research, 1370 Ave. of the Americas, New York, N.Y. 10019.

June 17-20, Monaco — **Retail DP Strategies**. Contact: International Division, National Retail Merchants Association, 100 W. 31st St., New York, N.Y. 10001.

June 18-19, Toronto — **Records Retention and File Management Seminar**. Contact: Thomas Wilds, Thomas Wilds Associates, Inc. 50 E. 41st St., New York, N.Y. 10017.

June 18-20, Newport Beach, Calif. — **Computers in Radiology**, sponsored by Institute of Electrical and Electronics Engineers. Contact: Prof. J. Sklansky, University of California, School of Engineering, Irvine, Calif.

92717.

June 18-20, San Francisco — **Introduction to Distributed Data Processing for User Management**. Contact: Ellen Sokol, Program Director, American Management Associations, 135 W. 50th St., New York, N.Y. 10020.

June 18-20, Dallas — **14th National Data Processing Security Seminar**. Contact: Director of Seminars, Data Processing Security, Inc. 235 N.E. Loop 820, Hurst, Texas 76053.

June 18-20, Washington, D.C. — **Second International Conference on Transnational Data Flows**. Contact: Donna S. Ahrend or Mike O'Bryant, Information Gatekeepers, 167 Corey Road, Brookline, Mass. 02146.

June 18-21, Glasgow, Scotland —

**Third International Conference on Computer Applications in the Automation of Shipyard Operation (Iccas '79)**. Contact: Iccas 79 Office, Department of Shipbuilding and Naval Architecture, University of Strathclyde, Glasgow G1 1XH, Scotland.

June 18-22, Cambridge, Mass. — **Current Issues in Information Systems: A Perspective for the '80s**. Contact: Center for Information Systems Research, MIT, Alfred P. Sloan School of Management, 50 Memorial Drive, Cambridge, Mass. 02139.

June 19-21, London — **International Conference on Contracting Practices in the Computer Industry**, sponsored by Online Conference Limited. Contact: Roy N. Freed, Powers & Hall, 30 Federal St., Boston, Mass. 02110.

June 24-27, Kiamasha Lake, N.Y. — **National Meeting and Seminar of the Association of Data Communications Users (Adcu)**. Contact: Sue O'Keefe, Adcu, Inc., P.O. Box 1184, New York, N.Y. 10019.

June 24-27, Vail, Colo. — **Computer Elements Workshop**, sponsored by Institute of Electrical and Electronics Engineers. Contact: Peter Verhofstadt, Fairchild, 464 Ellis St., Mountain View, Calif. 94042.

June 25-26, Chicago — **Forum on Information Resource Management**, sponsored by the Society for Management Information Systems. Contact: Ken Burroughs, DBD Systems, 1500 N. Beauregard St., Alexandria, Va. 22311.

June 25-27, Iowa City, Iowa — **First National Conference on Computers in Education**, sponsored by Institute of Electrical and Electronics Engineers. Contact: Dr. David Rine, Information Science Program, Suite 447 Stipes, Western Illinois University, Macomb, Ill. 61455.

June 25-27, San Diego — **Design Automation Conference**, sponsored by Institute of Electrical and Electronics Engineers. Contact: David W. Hightower, Texas Instruments, Inc., P.O. Box 225621, M.S. 907, Dallas, Texas 75265.

June 25-29, Cambridge, Mass. — **Project Design for DP Applications**. Contact: Director of the Summer Session, Room E19-356, MIT Cambridge, Mass. 02139.

June 26-28, Chicago — **Information Systems in Perspective**. Contact: International Word Processing Association Conference Services, 2360 Maryland Road, Willow Grove, Pa. 19090.

June 27-29, Philadelphia — **Syntopic VII**. Contact: Mark Hertzog, International Word Processing Association, 2360 Maryland Road, Willow Grove, Pa. 19090.

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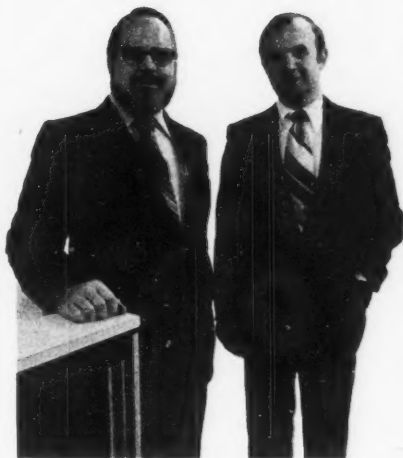
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The CW Calendar generally appears in the first and second issues of each month; events are listed a month in advance.

All conference announcements should be sent to Calendar, CW Editorial Department, 797 Washington St., Newton, Mass. 02160, at least six weeks prior to the month in which the event is slated to occur.

Because of space constraints, regional conferences cannot be listed.

# DATA CENTER RELOCATES WITH PIX.



How do you relocate a computer center 650 miles without disrupting service? EDP managers Eli Dabich and Jack Hiatt at Sun Life Insurance Company of America had only five months to find the answer.

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the software needed to operate remote CRTs plus unit record gear."

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"We've had near-100% up-time since installing PIX II, and are planning our second link now," he concluded.

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## EDITORIAL

### A Dangerous Temptation

Computer-based data bases can be very tempting collections of information to legislators and others.

A case in point is the proposal to use the data bases of such organizations as the Internal Revenue Service (IRS) and the Social Security Administration (SSA) in administering a "passive" draft system [CW, May 7].

The existence of such extensive files on American citizens has led proponents of a reinstituted draft to propose that they be used to register draft-age civilians.

Certainly this will make the government's job easier if it attempts to reimplement peace-time conscription. Young men and women will not have to go and register. They will hardly know that they are signed up.

However, this is a dangerous course for several reasons.

First, the data collected for the SSA and IRS files is volunteered by the public in an almost sheep-like fashion on the assumption that the data will be used only for the purposes for which it was volunteered. If this data is to be used widely for other purposes — particularly one as odious as conscription — people may stop volunteering such information.

Second, the proposal represents the cheap way out for the supporters of a reinstituted draft system. It would certainly be less expensive to conduct the registration this way and would hide the real costs of a draft system, which may turn out to be higher than those for the volunteer army.

And furthermore, the system would cut down on the psychic trauma that would otherwise be associated with reinstituting the draft. Students and other young people would not be as likely to fight the procedure if it is "passive" rather than active.

Under the active system, the potential draftee was subjected firsthand to the stupidity and bureaucracy of the selective service mechanism. After going through that, it was easy to protest not only the selective service but overall governmental bureaucracy.

If people want to reinstate the draft, they should do it honestly — with all the economic and psychological costs that entails. The passive draft system is a cop-out, planned to hide the real nature of the draft system — enforced, unwilling servitude — from the public for as long as possible.

IRS and SSA files should only be used for the purposes for which they were designed and congressional backers of conscription should go back to their drafting boards for other ways of registering people for the program.



## LETTERS

### Medical Record Privacy

The article on "horror stories" told at recent congressional hearings on federal privacy legislation [CW, April 23] quoted Jane Rogers of the American Medical Record Association as saying "there appears to be no known absolute safeguard against unlawful access to computer-stored information" with the implication that computer storage was *ipso facto* bad.

One feels compelled to point out that there is no known absolute safeguard against unlawful use of an automobile, either. We don't choose to forgo the benefits of the automobile because of this, however.

More to the point, there is no absolute safeguard against unlawful use of manual medical records. Indeed, a centralized computerized data base is much easier to protect than scattered sets of paper records.

Of far greater concern to me is the lawful use of medical information, however it is stored. It is of paramount importance that the relationship of confidentiality between a physician and his patient not be violated except in the case of overriding public need, such as the tracking of an epidemic.

It is equally important that both the physician and the patient known in advance under what conditions the confidentiality of their relationship will be intruded upon. I hope that Congress, in considering legislation, will address itself to this central problem, rather than the easier but ineffective approach of curbing the automation of health records.

Bob Brown  
Chief

Information Systems Bureau  
Medical Association of Georgia  
Atlanta, Ga.

### MSIS Not at Fault

"Horror Stories Rife at Hearings" [CW, April 23] contained a serious error in fact with reference to the

Multistate Information System (MSIS). By misleading juxtaposition and by incomplete coverage, the article implied misdeeds of which MSIS is entirely innocent.

First and most important, no suit for any purpose has ever been brought against MSIS. Second, the data stored in the MSIS system is protected from disclosure by law (Section 79j of the Civil Rights Law of New York) and by various physical and technological measures.

The lawsuit mentioned by John E. Shattuck of the American Civil Liberties Union never involved MSIS. It was brought by three psychiatrists, a social worker and three outpatients at Bronx Psychiatric Center asking the court to declare illegal and unconstitutional a policy of the New York State Department of Mental Hygiene requiring staff to enter on forms — and to send to the central office in Albany for recording in a computer — identifying data concerning outpatients.

The new York State Court of Appeals (the highest appellate court in the state) upheld a lower court dismissal of the complaint, affirming that the state had the power to provide a central facility for storage and retrieval of statistics involving patients in its facilities and that "no evidence exists to indicate that any supervening right has been invaded." The computer records at issue were not MSIS records but were those of the New York State Department of Mental Hygiene and consisted of data collected by employees of the department and stored in a computer system operated by the department.

In the interest of justice and of allaying public fears about the safety of sensitive records, I believe this clarifying statement must be made.

Eugene M. Laska  
Director

Information Sciences Division  
Rockland Research Institute  
New York Department of Mental Hygiene  
Orangeburg, N.Y.

## DATA PAST

### Five Years Ago May 15, 1974

CHICAGO — Then Vice-President Gerald Ford told National Computer Conference attendees here that federal protection of individual privacy was not sufficiently developed to prevent use of a proposed massive computer network to "probe into the lives of individuals." As chairman of the Domestic Council on the Right of Privacy, Ford was concerned that the proposed Fednet system might be instituted without some statement of its impact on privacy. The system would link federal agencies and allow the General Services Administration access to personal information from many federal department files.

CHICAGO — The establishment of a Computer Users Association was pro-

posed here and backed up with a hard cash offer "with no strings attached" to help in the formative period. The Computer Industry Association proposed such a group and promised to give \$50,000 in seed money for its early operation if users would get together and help raise other backing.

### Eight Years Ago May 19, 1971

PARK RIDGE, Ill. — The Certification Council of the Data Processing Management Association abolished academic requirements for the Certificate in Data Processing but increased work experience requirements from three to five years. The decision of the council was an about-face from the thinking it demonstrated two years earlier when it set a Bachelor of Arts degree requirement for the February 1972 examination.

WHITE HAT, BLACK HAT/Herb Grosch

# Computer Societies Ready to Take New Course

I've been browsing in the January issue of *Computer*, the excellent general publication of the Institute of Electrical and Electronics Engineers (IEEE) Computer Society. I started out to read a technical article about charge-coupled devices, with cost projections out to 1985, noted with somewhat raised eyebrows a membership ad for the British Computer Society and was caught up in a lengthy report of the November Computer Application and Software Conference, Compasc 78.

There was the usual hand-wringing about managing software projects, this time by Colonel Richard Thayer of the Air Force. (Parenthetically, he listed 20 problems of software engineering, technical and managerial. None were new, many were hopeless: "Procedures and techniques for designing maintainable software are not available." But the sheer leaden burden of 20 oh-veys was impressive.)

Then I noticed a headhunter display advertisement for a \$60,000 senior software scientist. And about this time, my browsing turned into concern.

What is happening in the Computer Society (CS)? How does it differ from and resemble my familiar Association for Computing Machinery (ACM)?

Where are the two societies headed? I belonged to the IEEE group and one of its predecessor societies, the Institute of Radio Engineers, for 20 years. When I quit, because of what then seemed the dead hand of the huge parent Institute over its computer members, the Computer Society was pretty dull and ACM — in spite of financial problems — pretty lively.

Today ACM has 42,000 members and is growing 10% annually. But CS, which used to be a good deal smaller, has more than 40,000 and is growing 25% a year. ACM has much more

money in the bank, having recovered from the earlier difficulties, but that's because CS has to send most of its dough off to hungry IEEE Headquarters. CS has ACM backed into a corner in the American Federation of Information Processing Societies (Afiaps) especially in Washington and international matters.

Paradoxically enough, I think the stodginess of the parent IEEE has been turned to advantage by clever CS officers. In both ACM and CS, most members are pretty happy: they get their publications, hear an occasional speaker at chapter meetings and join technical committees.

But ACM is completely independent and fiercely self-governing. There is a powerful and demanding Council; vigorous contests for seats thereon and for officerships; the machinery of control is out in the open and intensively observed.

CS, as a subgroup of the huge institute, and with only a tiny staff of its own, is governed more like a large ACM special interest group. Elections are played down, the machinery of governance is seldom discussed in CS publications, new projects are started without reference to the membership — it's a closed operation.

## CS Burgeoning

I prefer, and much enjoy, the ACM system — and voted with my feet when I left IEEE/CS. But CS is burgeoning. Membership growth is not the whole story, of course; the Data Processing Management Association (DPMA) also grows and remains as dreary as a bucket of wet card chips. But CS is starting new publications, putting on

new conferences. I'll list several reasons, in addition to the "insider" government, why I think it can do so.

One is certainly the success of computer hardware. The CS is supposed to be the hardware outfit; ACM, the software one. But software is gummy (poor Col. Thayer!) and hardware is magnificent. Moreover, there is real force, economic and practical force, behind the idea of putting software into chipper. The reverse idea, of maximizing software, died many years ago — perhaps with Turing!

Then there is the Chinese Mafia. It works enormously hard and is exceedingly effective. Its members make terrific meetings chairmen, program chairmen, session chairmen and technical committee chairmen. I've worked with many of them and met a dozen more as fellow voyagers to Taiwan last December. They belong to both societies, of course, but seem to be more active in the IEEE; for instance, they edit both new *Transactions*.

Oh, and don't bother to write the editor that I'm anti-Anglo-Saxon. He knows!

## Important Delineation

There is a deeply important difference, one at the very heart of my concern. The ACM has, partly perhaps through inertia but largely by explicit choice, not intruded much into hardware. That's in spite of the rather misleading name, Computing Machinery, which was a historical choice made decades ago and now much regretted.

CS, however, has moved vigorously toward software. There is a Technical Interest Council on software and ap-  
(Continued on Page 28)

## THE TAYLOR REPORT/Alan Taylor

# IBM Should Clarify Series/1 Cobol Support

The recent column on IBM salesmen offering customers Series/1 Cobol last year that turned out not to be quite as expected [CW, March 26] has turned up some rather odd holes in the maintenance protection available to customers of IBM software. This is particularly important because software, rather than hardware, may be the big cost on some IBM systems in the future.

It appears that IBM, having protected itself coming and going with contracts, can remove checks from the software it supplies when it wants to, even though that degrades the usefulness of the product. It can then put the blame for such deficiencies on the non-IBM

Next week, Taylor looks at recent developments with Radio Shack's TRS-80 computer.

software supplier and, at the same time, sell both hardware and software in part based upon the dangerousness of the IBM-supplied product.

Users need to know how the game can be played this year; and anyone who has more information as to what exactly went on over the past year or so can write or call me via *Computerworld*. I'll be very glad to hear from you.

The major question is whether IBM's representations to the program's users are correct. My information suggests that it is only made truthful by an ambiguity in the wording of the maintenance agreement. But more of that anon. First, some background.

## Need for Software

About a year ago, IBM found that the Series/1 needed software in order to sell as well as IBM hoped. In particular, it needed Cobol. But even to get Cobol working, monitor systems were needed. Monitor and compiler make up quite a complicated packet, one

which IBM was not ready to offer from its own resources.

This software then became, like other software, a marketing weapon and involved IBM's use of independently produced Cobol.

These programs, which had not been authored by IBMers, had been developed when IBM was providing no support. It was put on the new hardware so quickly that it is obvious the authors were unusually skilled and greatly interested in the specific technical problems of users.

The Series/1, however, comes in more than one version. Nowadays, the IBM marketing stress seems to be on later versions of the machine and so the Series/1 Cobol software that is being represented as non-IBM and is generally available is not in fact the software written by the original author at all. Indeed, it isn't even for the same hardware!

Instead, IBM appears to have taken the package into its Boca Raton, Fla., facilities, given it to one or more teams to adapt to other hardware currently being promoted and then distributed it with a guarantee of having it maintained "through the program authors" until various dates like Nov. 30, 1980.

Out in the field, meanwhile, the marketing need for this independent product to sell the mini is waning, as a real, true-blue, IBM-developed Cobol for the Series/1 is about to appear. The IBM salesman in 1979, unlike in 1978, has three arrows in his Series/1 quiver — the top-of-the-line IBM Cobol, which will at the least have guaranteed maintenance beyond 1980; the IBM-targeted hardware version of the outside experts' Cobol that is the standard offering; and the original non-IBM-written product to provide in an emergency when all else fails.

## Who Cares About Maintenance?

The major problem does not appear  
(Continued on Page 28)

# the hexadecimal kid and his faithful dog ascii

A FANTASY IN SIXTEEN BITS  
by Richard Forsyth

BIT 2  
(A TWO-BIT OUTLAW)

The Hexadecimal Kid and Simula have been ambushed in their remote mountain hideaway by the evil Dr. Null, whose sole objective is to reduce every binary digit of information throughout the world to zero, thus destroying civilization as we know it. Hex's faithful dog Ascii (the dog with the Post Office-approved interface) has electrocuted himself by biting through a 25,000 volt cable, so is temporarily out of action.)

"Can I sit down now?" Simula asked after a while. "If you go on much longer, I'll fall asleep on my feet."

"Certainly, my dear. You speak more truly than you realize," the sinister Dr. Null replied. "But first allow me to present you with this little ornament."

He draped what appeared to be a silver medallion around her neck,

and Simula sat down.

"I am actually quite proud of that little device," he continued. "I call it my 'Number Cruncher.' It simply swallows up binary data."

"Let me explain. My plan is really quite simple. It has the hallmark of genius. That little pendant resting on Simula's fair skin is a microprocessor programmed to simulate an infinite array of NOR gates, each with one unity input. Attach it to a data transmission channel and any incoming information simply vanishes. Whatever the input, the output is all zeroes."

"I need hardly tell you what would happen if one of these were connected to a node of the Network. It would, over a period, degrade and ultimately annihilate all the data in the Data Base."

"But the Data Base is holographically organized. There are redundant copies of all data distributed throughout it," Hex countered.

"Indeed," Dr. Null admitted, "but with a sufficiently high rate of data capture or, better still, many of these devices at several critical nodes, the inevitable effect would be a gradual impoverishment and fi-  
(Continued on Page 32)

## HUMAN CONNECTION/Jack Stone

## An Open Letter to DP Management

Dear DP manager:

When Ed Yourdon reported that "management was to blame for the general failure of the first 'structured revolution'" [CW, April 9], he was, in my judgment, only skimming the tip of the DP-management-failure iceberg.

Why do I say this? Because, although your department is widely recognized — for good or evil — as the primary emissary of change in the organization, I believe that your department, if part of the vast majority, is the one most resistant to change.

When I refer to change in this context, I am talking about management activities other than those directly related to computing technology.

ing technology.

There are many, many tasks related to "systems" management that you do very well, and they collectively demonstrate your expert exploitation of the technology.

But there are many, many others, which constitute the "business" management functions of your job, that I fear you do very, very poorly. They relate to, among other things: implementation of policies and procedures, effective human communications, proper control of operations, managerial leadership, setting and sticking with priorities, building team spirit, and influencing top executives.

And I think it's time that I address

these issues head-on in upcoming columns.

You surely are wondering wherein I derive the authority for carrying forth such discussions. Well, the authority comes from you and hundreds like you who, during my DP management lectures, surveys and private conversations, have acknowledged the existence of these problems and validated my approaches to their solution.

You don't have to be a research genius to come up with the same conclusions that I have. If you haven't done so lately, find out for yourself in the next staff meeting what your own management team feels about its performance as business — not technical

— managers.

Try asking them such questions as the following, and IF the answers suggest you've got a dynamite management THEN SKIP to the next page; ELSE keep reading.

- Are we perceived by user executives as their full partner, working together to shape the future of the business?

- Are we really in control of our overall operations or do we seem to always be running in crisis mode?

- Are our people as loyal to the company as members of other departments?

- Are we providing educational, promotional and social opportunities to all of our people in an even-handed way?

- Do our external communications enhance the image of our professionalism?

- Do we give the proper attention to the sociological and psychological impact of new systems on end users?

- Have we presented top management with the actual costs of running a DP department in ways it can understand and support?

For the balance of the column, let me discuss the last question and relate it to a recent experience of mine.

When I lecture on DP management, I usually present brief case studies — some call them "horror stories" — that I have encountered in my travels.

I then survey the audience as to the realism of the cases relative to their own installations.

At a recent Data Processing Management Association regional meeting, the results were about the same as usual. Of the 50 or so attendees, all but a handful said that the situations were not unique but typical of their own experience!

#### One Who Disagreed

Only one man said that the stories were totally unrealistic and unrepresentative of his installation. I asked him later if he would comment on what makes his operation so different.

"Do you know the average percentage of a company's revenue that is set aside for the DP department?" he asked.

"I think it's about 3%," I replied.

"Closer to 2%, maybe 2-1/2%. Do you know what my budget is?"

"Nope."

"Seven percent."

"Wow!"

"Do you know what the average delay time is to get new applications initiated?"

"Yep! Two years!"

"Nope. Closer to three. Do you know what ours is?"

"Lay it on me!"

"Four months. You know, if I were to summarize your ranting and raving today, I would say that you were telling that group of DP managers in a dozen indirect ways that they don't have the guts to tell top management what it really costs to do the data processing job!"

Cordially,  
Jack Stone

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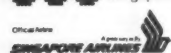
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# DP Societies Ready to Take New Direction

(Continued from Page 25)

plications; there are CS technical committees on data bases, machine intelligence, mathematical foundations, operating systems and software engineering. Compsac is to be an annual affair, devoted entirely to software and applications — ACM territory.

After starting no new publications for a decade, CS put out an *IEEE Transaction on Software Engineering* a couple of years ago, and just recently an *IEEE Transactions on Pattern Analysis and Machine Intelligence* (PAMI).

So what I see is a strong attraction for ACM members to also join IEEE/CS, but not for CS members to join ACM. In fact, almost all the key people in starting and running the new IEEE Committees and journals were already

ACM members, Chinese and Anglo-Saxon alike, and computer science professors in many cases besides.

So in sum, the Computer Society has entered both sides of our field, has more vigorous people or at least has made better use of them and can be proud of the performance and promise of its original "product," hardware. The ACM has a more open government, financial independence, a more highly developed technical committee movement, and — not mentioned before but extremely important to me personally — a concern for ethics and for professional and human freedoms.

If those remain the strengths of the two societies, the IEEE will weaken ACM — share the abilities of the Portia Isaacs and the Gerry Engels, but

not offer the Lowell Amdahls, Dick Merwins and Raymond Yehs. ACM will survive, but it will gaze from the sidelines at bubble memories, plasma, superchips, optical fibers and hologram displays. And it will play third fiddle in Afips.

## Time For Merger?

That's a poor future. The British do it better. The Japanese do it better. We're the world leaders in computer technology, and we should organize to further support that leadership.

Policy matters, standards and professional rights suffer when our associations work poorly or are insulated from the Real World by a layer of federation bureaucracy. I believe the time has come to look seriously at merging

the two outfits — get the 40,000 CS live wires out from under the dull switchgear guys and out from under the costs of the IEEE headquarters. And open a window for ACM young people and the ACM practitioner community into the fantastic world of future hardware!

Afips is certainly a possible starting point, except that it has its own cadre of ladder-climbers who will not want to regroup. But the small societies who complicate the problem only hang in there because of the National Computer Conference prestige and money and are already finding that they mostly get to share the prestige, period.

The NCC agreement is very much a separate matter, and could be renegotiated to protect DPMA and the smaller organizations and give the merged ACM/CS the appropriate share, even if Afips disappeared.

The aerospace boys and the DPMA, and some of the others, have direct Washington representation — no problem there. I think it could be done.

I call on Brother McCracken and Cousin Feng to have a go: move toward an American Computing Association!

## IBM Should Clarify Support

(Continued from Page 25)

to be in the original but in the IBM-modified version. As far as I can tell, there is no reason to believe that the problems I wrote about in March are coming from the non-IBM authors' work. Instead, they seem to be coming from the modification policies and efforts which only IBM can control, and for which, I think, IBM should take full responsibility.

Software modification, as we all know, can be dangerous both because of mistakes and because of incorrect policy decisions. In this case, it is perfectly possible that important checks have been left out in some distributed versions.

Systems with multiple terminals, for instance, need special protection. The original version was aimed for multiple-terminal use and had protection features. The modification, aimed at a different sector of the market — but able to be used for multiple on-line terminal systems — has to pack other material into the monitor. Something has to go if memory limits set down by policy are to be kept, and this "something" appears to have included some checks to prevent two terminals from accessing the same record simultaneously.

So the IBM standard offering can be effectively deficient beside the original version. Assuming this is so, now what happens?

## Semantic Trap

The IBM manuals concerned tell the user quite openly what happens in the event of trouble. The warranty states: "Through the program authors IBM will, without additional charge, respond to a reported defect in the current unaltered release..."

I don't know about you, but reading this I would think that the original,

(Continued on Page 32)

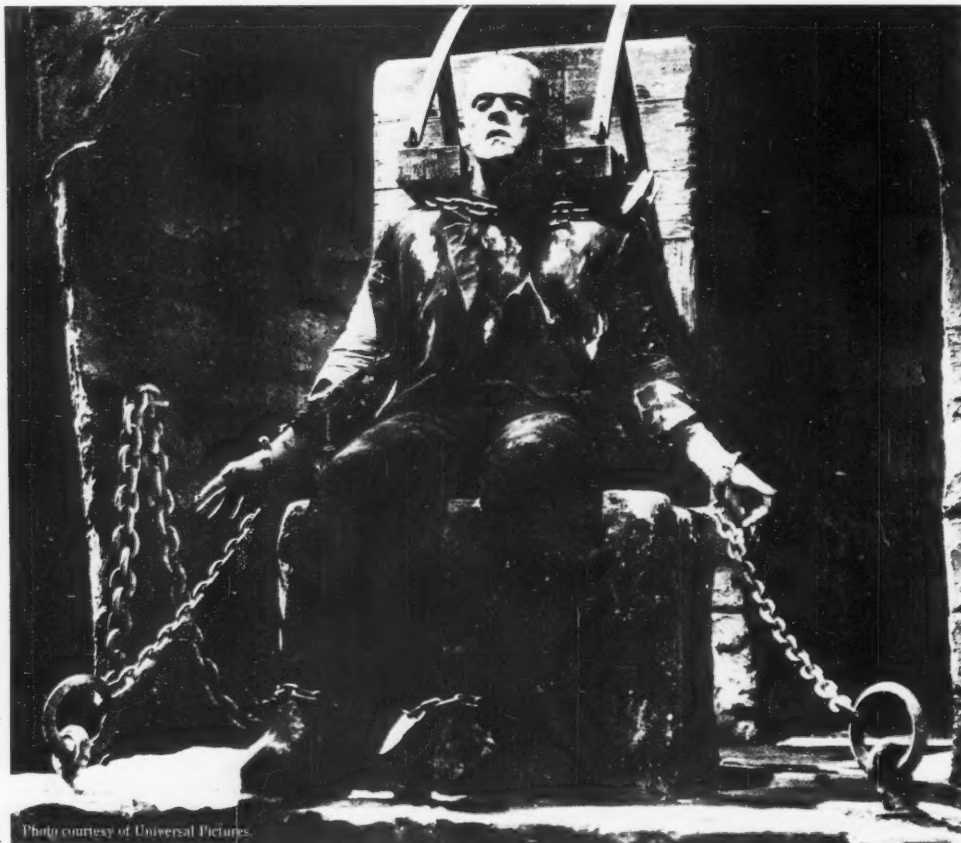


Photo courtesy of Universal Pictures.

## CalComp's mini-peripheral sales reps won't ever tie you down to outdated equipment.

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## READER COMMENTARY

# FM Works — If Supplier Acts as Specialist

By Frederick A. Gross

Special to CW

After months of editorial beating around the bush, someone has to tell Dick Brandon that his definition of facilities management (FM) — "turning over the DP operation and design segments to a third party" [CW, Feb. 19] — is completely outdated in today's FM marketplace.

No responsible FM firm today will come into a client's facility and run equipment and programs without knowledge of the client's business. Today's successful facilities management firms — and there are many whose contracts are renewed year after year — combine the attributes of a consultant specializing in his clients' particular market segment with DP expertise.

In fact, all the "negatives" Brandon has stated in his series of wandering criticisms of FM do not apply to an FM firm with subject matter expertise — a firm that specializes in its clients' limited market and special needs.

After 10 years of success as the country's foremost specialist in FM for the particular market of local government and higher education computing, we at Systems & Computer Technology Corp. (SCT) can say definitively that facilities management *does* work — and is cost-effective — when the FM firm is experienced and knowledgeable about its clients' unique problems and requirements.

## Area of Agreement

There is one area where we agree wholeheartedly with Brandon, however, and that is in his complete exclusion of the public sector from his FM criticisms. In our experience with the local government and education markets, we find them to be completely different from the private sector in needs, management and orientation.

These clients talk to each other. A firm specializing in this market can never afford to give less than excellent service, because satisfied client references are our strongest selling point.

There is no competition between neighboring colleges or municipalities. Where there is competition, it is with the private sector — and that competition is for the best talent in DP and systems design. And it is a competition that the public sector, under increasingly stringent budget restrictions, cannot win. This, among other areas, is where an FM firm is a boon to the public institution.

In our experience, FM firms are much more likely to attract a higher level personnel than user institutions. Traditionally, expertise gravitates to consulting firms. Facilities management firms, with their "faster" career tracks, attract and retain that type of staff.

The very possibility of advancement which Brandon cites as a negative in facilities management for the private sector is a plus when recruiting FM personnel for educational or governmental clients. SCT, for example, can attract high-level staff much more easily than can in-house operations in colleges or local governments.

In the fields of government and higher education, salaries are not keeping pace with industry levels. Espe-

cially with the advent of Proposition 13-type legislation, publicly-supervised institutions are hard-pressed to keep their compensation on a par with industry averages.

Continuity is another staffing advantage provided to client institutions. We all know that the DP field is one of the most mobile in the job marketplace. The demand for highly skilled people is so high that an employer — any employer — has difficulty maintaining continuity within his changing middle management staff. This has become an overwhelming problem with the frozen salary scales for governments and higher education.

Another important area where FM

for the public market differs significantly from FM for the private sector is in the level of management involvement. While many commercial enterprises have been steadily promoting their systems people to higher and higher levels of management, the same has not been true of government and education.

The implementation of FM for a local government or college, however, because of the dollar value of most contracts, requires a direct reporting line to top-level management. That direct involvement results in direction and accountability from top management to the facilities management team on a regular basis.

No firm — in any field — wants a "one-time" contract. The costs associated with signing "new business" are much greater than the costs of servicing a client so well that a long-term (three-year) contract is renewed.

Today's FM client is not the "inexperienced contractor" Brandon would have his readers believe. It is a sophisticated marketplace, and one in which performance, accountability and cost-effectiveness are demanded. For the specialized market, firms with both subject matter, expertise and computing talent are highly successful.

Gross is president of Systems & Computer Technology Corp. in Philadelphia.

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# Database: Cullinane

## Refreshing Story

The front-page story, "Bank DPer, Businessman First," in the April 16 issue was refreshing — a sign that *Computerworld* recognizes the importance of people, their aspirations, progress, motivation and insights.

How people move through organizations needs to be documented and disseminated as expertly as CW did in this case. The matter of career ladders and growth possibilities from "real life" is of great concern to teachers, to our future DPer's and to our young and aspiring programmers.

Albert L. Goldberg

Wayne, Mich.

## ACM Out of Touch?

Just what we need, an outline of how to train computer science graduates

["ACM Proposes Computer Science Curriculum," CW, April 9]. I noted one obvious flaw: no mention of any people-related courses, such as psychology, sociology, organizational development or business administration; only machine-related courses and skills are listed.

This shows how out of touch with reality the Association for Computing Machinery (ACM) is, especially since numerous articles and speeches recently carried in CW and other trade journals noted the increasing demand for business professionals, who can effectively use the computer, rather than computer technicians who understand the computer and not the business world.

I wonder, is there a relation between

the ACM's action and the recent article about the coming glut of DP graduates?

James R. Shannahan

Santa Clara, Calif.

## Another for Alan Taylor?

I am troubled with inflation. My junk mail is increasing at an alarming rate — primarily from companies using multiple mailing lists.

I am involved with training, and I do like to receive notices of course and seminar offerings. But I receive a two-to four-inch pile of mail each day with two to 10 duplications of each piece.

The *Computerworld* subscription piece came to me six times. Although I

can throw them away without opening them, it takes either my time or a secretary's to go through the pile.

Promotional mailing has gotten out of hand. Companies that send such mail have a responsibility to develop their own mailing lists (from purchased ones, if they wish), to eliminate duplications. With modern DP equipment, this is not difficult.

W.W. Varner

Portland, Ore.

## Comments on Cards

"Growth Predicted in 'Dying' Card Mart" [CW, April 23] was especially meaningful to us at Decision Data Computer Corp. for a number of reasons.

First, it reinforced something that we have said right along — the punch card market is a growing market.

Second, punch card-oriented solutions to DP problems at remote locations are well-received in the marketplace, as our experience has indicated.

Third, we agree that mid-range card-processing speeds are the order of the day.

What we would like to debate, however, is who is "the major force in the market." While I don't know all the criteria that were used in awarding the title, I would like to make *Computerworld* aware of some of the things our firm is doing that at least might make it a draw:

- We are the only company that continues to manufacture new card data recorders.

- Our punch card terminal offerings include the terminal and some innovative ideas that make card-oriented terminals both effective and economical.

Robert P. Young

Manager, Marketing Services

Decision Data Computer Corp.  
Horsham, Pa.

## Pleased, But Two Points...

Needless to say, we were very pleased with the coverage *Computerworld* gave to the introduction of the Basic/Four Corp. Business Information Network at Interface '79 [CW, April 16]. Two statements, however, in "Network Facility Has DP, WP, Electronic Mail" need clarification.

The distributed data processing system is aimed at multisite organizations with annual revenues that range from \$15 million and up — not from \$500,000 to \$25 million. The cost of the individual systems in the network range from \$25,000 to \$150,000 — rather than the network itself.

Alan M. Davis

Director, Sales & Marketing

Basic/Four Corp.  
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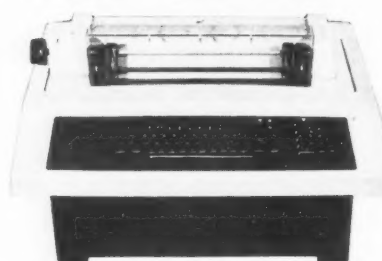
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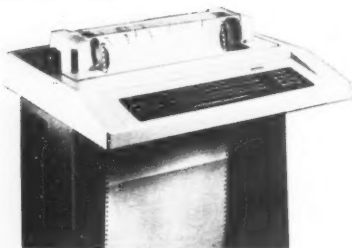
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## From a 'Conscientious User'

The nature of internal auditors is to state, without reason or selectivity, that "the nature of DP personnel" is that they want "a new piece of hardware to play with." That statement goes beyond "speculation."

Lisa Hall should look at her own findings of her audit of Illinois' Department of Administrative Services ["A \$569,000 Misunderstanding?" CW, April 30] which led to some "costly mistake."

"The problems ... encountered probably began with an inadequate collection and analysis of data..." she said. I suggest that Hall take her own implicit advice; make sure you have collected qualifying and justifying data before deciding on a course of action!

I, for one, do not appreciate being categorically placed with those who are irresponsible in that way, nor would I work for a firm who was, for very long.

On behalf of all conscientious users, I accept her apology.

David M. Caranci

Torrington, Conn.

## About 'Informatics'

In a recent issue of *Computerworld*, the facts of the origin of the word "informatics" were reported incorrectly. The term was coined in France 1962 upon the formation of the company Societe d'Informatique et Appliquee. It has indeed become an official word in the French language.

The same year, Informatics, Inc. was formed. In fact, Philippe Dreyfus and his associates coincidentally coined the word in March 1962, at the same time as I and my associates coined it in the U.S. Philippe Dreyfus and I have often remarked about this lexicographic coincidence.

Indeed, the word is used generically throughout the world except in the U.S., where Informatics, Inc. has exclusive rights to its use.

Walter F. Bauer  
President

Informatics, Inc.  
Woodland Hills, Calif.

## Mistakes on Anthropology

After rereading "Biologist's Research Sheds Light on Man's Age" [CW, Feb. 5], I finally became angry enough to write and at least offer some counter opinions.

Whether the Australopithecines are ancestral to man is still a matter of scientific debate, but to suggest that they are ancestral to orangutans or some other member of the monkey family would require either an evolutionary miracle or a complete rethinking of everything we know about evolution. One may legitimately debate the evidence for Australopithecus as a direct ancestor to man, but not by proposing scientific absurdities.

I do not believe it is true that the orthodox view is "that culture and tradition represent a very thin veneer of civilization on a heavy bedrock of prior animal behavior and prior animal genetic makeup." This view seems to contain enough common sense that perhaps it ought to be the orthodox view, but just the opposite seems to be the case with respect to most contemporary anthropologists. The view quoted is one espoused by ethologists such as Konrad Lorenz and Robert

Ardrey and not yet accepted by anthropologists generally.

Finally, the author seemed to imply that aggression is a peculiarly human trait. It is indeed a human trait but is certainly not peculiar to humans. It is certainly not true that "anthropologists have overemphasized the role of genetic factors in determining such human traits as aggression."

The only thing most anthropologists have ever done with the subject of aggression in humans is attempt to explain it away as an unpleasant characteristic that shouldn't really exist anyway, which is apparently what biologist Charles Oxnard would like to do. If the author correctly summarized Oxnard's views, then I would have to

say that Oxnard belongs to the Richard Leaky school of wishful thinking.

A very great scientist, Dr. Raymond Dart, once suggested that having tried everything else, men ought to try using the truth to explain their ancestry and behavior. Perhaps, as Ardrey states, we just haven't tried everything else yet.

I suggest that CW stick to reporting on computer technology.

J.W. Tucker

E. Riverdale, Md.

## Sorry, Readers

While rereading my recent letter to *Computerworld* [CW, March 19], I re-

gretfully noticed the regressively consistent use of "he" whenever the text called for a third person singular pronoun. English unfortunately lacks and needs a genderless human pronoun for this context:

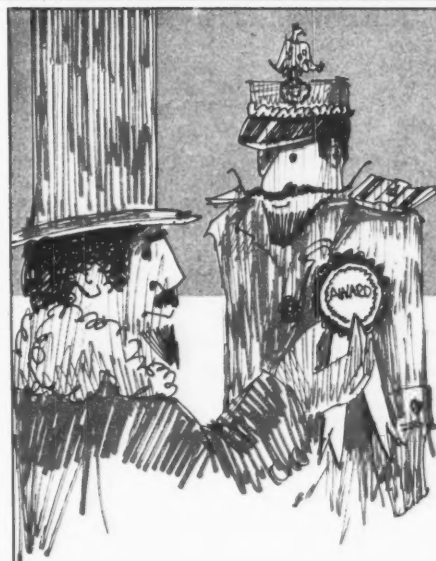
- "It" is nonhuman.
- "Her" or "she" is awkward and overemphatic.
- "S/he" is an unpronounceable neographism.
- "You" makes the text sound like a soapbox speech.
- "They" seems ungrammatical.

My partner suggests simply using "she" for the next hundred years to start redressing the past imbalance. I personally prefer the method of flipping a coin whenever the text requires a choice.

I regret my failure to use that method in the letter. Please convey my apology to any critical readers.

Robert Higgins

West Chester, Pa.



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# Hexadecimal Kid Learns of Dr. Null's Plot

(Continued from Page 25)  
nal collapse of the Data Base."

Hex still challenged him. "You would never get away with it. Every message passed over the Network has check digits. There are passwords that change daily; there are protocols that you cannot know and thousands of built-in validation circuits. It's a typically human conception — riddled with bugs, inconsistencies and loose ends. It could never work."

"That is precisely were your logical, robotic little mind fits in, my friend, with your intimate knowledge of the network and the data control software. You ought to know how to get around these tiresome protection mechanisms."

"What I have in mind, you see, is a

protocol-transparent version of my data-cruncher. It will literally eat up messages: a transmitted packet will arrive and nothing but the check-data and routing information will emerge. Soon we will have the wires buzzing with ghost messages — totally void but for the message-control bits. And the beauty of it is that the System will be blissfully unaware of any change."

"Well, you won't get any help from me," Hex declared firmly.

"I think you may be mistaken there," Dr. Null answered. "Would you tell me the time of day?"

Hex glanced at the real-time clock. "It's hour 10.25 on day 121 of year 88 (decimal). Why?"

"Because it is about time, I would guess, that your dear Simula had her

daily fix. None of you puny automata can last very long without a dose of teleprocessing. It is like a drug. That is your weakness; you all have to plug into the Network each day to update your memory banks."

"Of course," Hex replied, "there's nothing unhealthy in that. We all need to contribute to and receive from the Data Base regularly. That is how we share experience. That is what makes the Data Base a living, growing organism, which is why we are superior to you primitive humans."

"You cannot transcend your individuality. You find it almost impossible to assimilate another being's learning. You have to learn everything afresh from scratch. Your storage capacity is pitifully limited, too, whereas the Data

Base can hold an unlimited amount of information," he continued. "But even a deranged human like you could be cybernated. It's not too late. Look at me, I'm more than half human myself, yet I am a respected member of the android community."

"Disgusting!" Dr. Null said with obvious revulsion. "I want none of that. And I intend to keep you from it too, until you agree to work for me. I am prepared to wait as long as necessary. And remember: if you try any tricks, I can wipe out all cognitive activity in Simula with one interrupt signal."

Hex knew that Simula had been working on her Pidgin English compiler for two days flat out without time for a nibble of data or even a disk refresh. By now her hash tables would be perilously near the critical ratio.

He could see her eyes glazing over. It could not be long before she suffered semantic overload. In desperation, he loaded a new untried heuristic problem-solving algorithm at the front of his high-priority queue and set its running with all interrupts disabled. It was a dangerous gamble, but this was no time for a hesitation crisis.

What is the depth of Simula's run-time stack?

Will the Kid give in to Dr. Null's insane demands?

Find out in our next bit!  
Forsyth is software manager for RAIR Timesharing in the UK.

Copyright 1979, Richard Forsyth

## IBM Should Clarify Support

(Continued from Page 28)

non-IBM authors must be in charge of the system's maintenance. And, thinking of the skill, user interest and dedication that it must have taken to get the whole system visualized, designed, written, tested, installed and in use more than a year ago, I would consider their maintenance management a very valuable safety feature for the user. But then I realize the word is "authors," not "author," and that it is undefined. Now I don't know what to think!

In fact, it may well be that career IBMers, doing what they are told to do — and without the pride of original authorship — may qualify as "authors."

As far as I can find out from users of the Series/1 Cobol, the IBM "authors" are taking on the maintenance. While a Virginia firm was the original author of the system, the IBM software people in Boca Raton are apparently handling considerable amounts of the maintenance without having to check back with the Virginia authors for approval. So effectively, IBM decisions, budgets and goals may be being interposed by letting the word "authors" go into the plural and undefined.

I don't like to think it was done deliberately, although it could well have been. But I do think IBM, having told users that there is some safeguard in having the program authors respond to reported defects, should also release the contracts between itself and the original authors.

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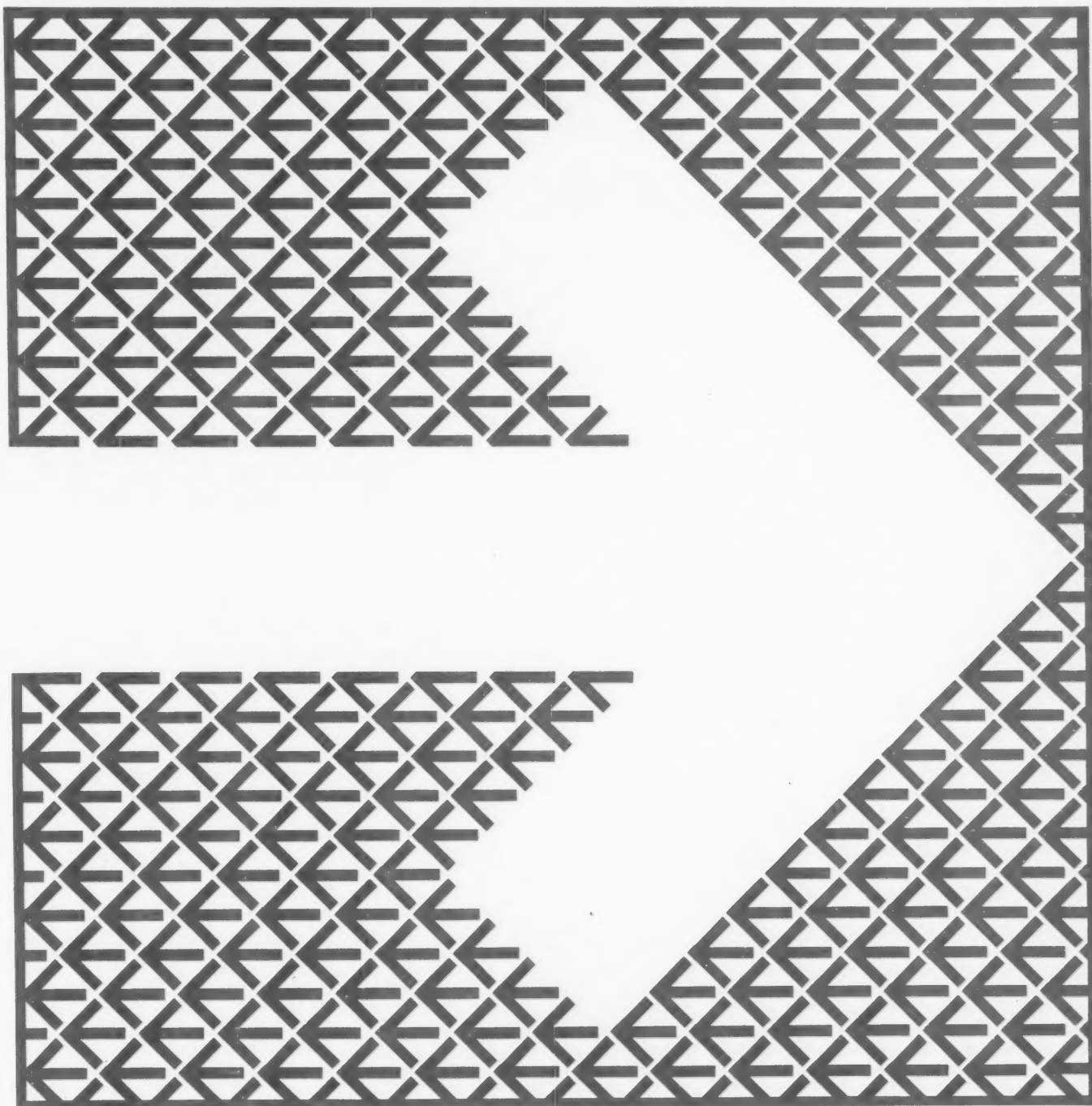
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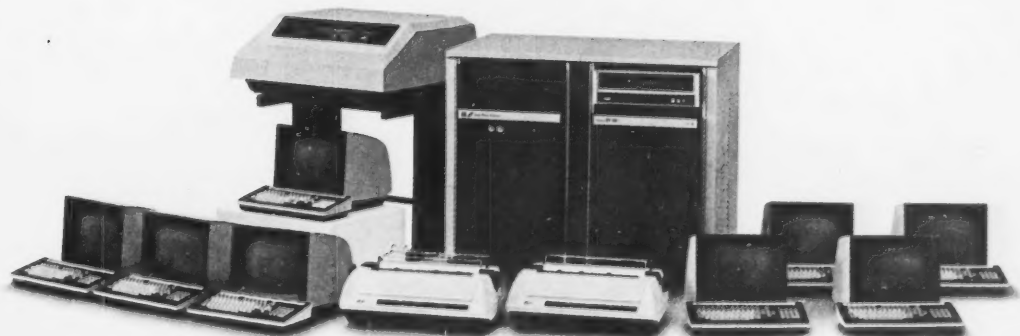
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## SOCIOLOGY OF COMPUTING/Robert L. Glass

# Fatal Flaw Stymies 'Word Processing Pioneer'

What's the hottest item in the quest for the automated office?

Word processing, right?

How can there be a "project-that-failed" story about word processing? After all, it's about as hot on the stock market as it is in the automated office. What could go wrong in a Cinderella success story like that one?

To answer that question, let's turn the clock back a decade or two, back to a time when the name "word processing" hadn't yet been coined and magnetic cards were the state-of-the-art in the automated office. Back to a point in time, in fact, when the state-of-the-word processing art was primitive with a capital PRIM.

Quentin Pen was on the staff at the Ivyland College computer center at the time. Quentin — called "Quill" by his friends — was excited by the variety of research activities he saw emerging around Ivyland which made use of the computer. From nuclear physics to fisheries, a steady stream of researchers poured a steady stream of program card decks across the batch control counter of the computer center.

It was when Molly Tongue of the Mideastern Languages Department began using the computer to print Arabic language text that Quill got the bright idea which is the subject of this story. If Arabic, for all its nuances and subtleties, could be computer-

processed, why not English text? That is, why not let the computer actually produce final text copy? For letters. For documents. For textbooks. For....

The more Quill thought about it, the better it seemed. In between consulting with computer center customers, he began doodling with some concepts on what he called "document processing."

The more he doodled, the better it seemed. He could page-number and paragraph and indent and all that vital trivia, no sweat. He could right-justify and multiple-column-per-page and footnote with only a little more work. He could even automatically derive indices and tables of contents; and although the sophistication level of his

concepts was increasing, none of it was beyond the state-of-the-art.

Automated document generation, he began to realize, was a potentially explosive breakthrough analogous to the copier of less than a decade before. And there Quill was, conceptually in the middle of it.

## Real World Tryout

To try out his concepts in a real-world setting, Quill built a first-phase version of his document generator, deferring some of the more sophisticated concepts. Then he volunteered to publish the next issue of his professional society's local chapter newsletter with his newly built tool.

"I'll wow my colleagues with a right-justified, two-column-per-page layout," he thought smugly to himself. The newsletter had traditionally been typed with a ragged right edge and no pizzazz whatsoever.

It wasn't until most of the newsletter text had been entered into the computer that Quill saw the problem coming. He may have pushed the state of the art in page layout, he began to realize — but it really didn't matter very much. In fact, it didn't matter at all.

The new, fast, sleek computer on which Quill had built his system had a new, fast, sleek printer. Which only printed upper case characters! And nobody — not even Quill, he realized when he tried it — could tolerate reading English text printed entirely in capital letters!

## Hardware Dud

Quill's document generator went downhill rapidly after that. Softwarewise, it was a whizbang. But hardwarewise, it was a dud. Nobody made upper and lower case printers, back in that day and age.

There was no way to salvage it. His spirit broken, Quill quit a few months later and went to work doing application software development for Clickety-Clack and Western Railway. There he remains to this day.

It's some consolation, now, to Quill Pen that he was more than a decade ahead of his time. But when your ahead-of-its-time project is a failure, hardly anyone gives you merit badges for pioneering. And there's no payoff you can carry to the bank, either.

No wonder, then, that when Quill hears someone extolling the virtues of word processing in the automated office, a wry smile flicks at his lips, and he walks away from the conversation. Word processing may be the hottest thing around, but Quill just plain doesn't want to talk about it.

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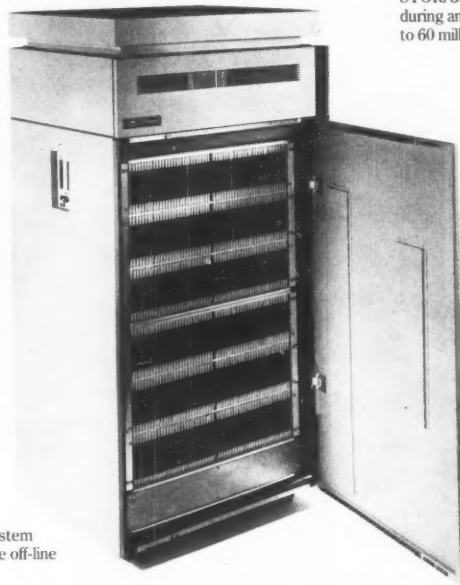
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## Marking 20th Anniversary Codasyl to Seek Help From Conferees

By Don Leavitt  
CW Staff

WASHINGTON, D.C. — "Help us celebrate what we have already been able to accomplish. Help us determine what we should accomplish in the future."

That invitation — that appeal — was issued recently by Jack L. Jones to DP professionals and implementors to encourage them to attend the 20th anniversary meeting of the Conference on Data Systems Language (Codasyl), which will be held here next week under Jones' chairmanship.

The meeting will take place at the Quality

Motor Inn in Pentagon City, Arlington, Va., May 21-22. A clear indication of Codasyl's desire for broad-based participation, the registration fee — including a luncheon — has been set at a nominal \$25.

Vice-president of information systems at Southern Railways and chairman of Codasyl's executive committee, Jones said that as far as he is concerned the major thrust of the conference is to find out what users and implementors feel Codasyl should be doing from now on.

The formal agenda is heavily laced with reports of work currently under way in Co-

dasyl's development committees. The agenda was arranged that way to establish a base of understanding from which attendees can — and hopefully will — put forth meaningful suggestions for future work, Jones said.

### Not a Standardization Outfit

Codasyl was launched in May 1959 to provide the DP user community with a high-level programming language that would be useful for commercial applications and available to a wide spectrum of computer systems. Cobol — the Common Business-Oriented Language that developed out of the original meeting — is probably the most widely used programming language in the world. Codasyl's Cobol committee continues to refine the definition of the language as conditions and user requirements change.

Development of concepts and facilities, particularly in support of programmers, is Codasyl's function. It is not a standardization body, although it works closely with the National Bureau of Standards and the American National Standards Institute when those organizations consider standards related to Codasyl's work.

Codasyl tries to balance users and implementors on its committees, and committee chairmen are always interested in talking to people who have something to contribute and who might like to work with the committees, Jones noted.

Cobol is just one aspect of the work currently under way under the aegis of Codasyl. (Continued on Page 39)

## Updated 'System 2000' DBMS Ready for IBM-Based Sites

AUSTIN, Texas — Release 2.90 of the System 2000 data base management system (DBMS) from MRI Systems Corp. boasts improved performance, documentation, training and user conveniences, according to a spokesman.

Intended for IBM-oriented installations, the release has reduced CPU times as much as 59% in a variety of processing mixes, he said, adding that the improvements are especially noticeable in the system's Programming Language Extensions (Plex) and Self-Contained Language environments.

Performance in the high-volume, multiple-user processing environment has been improved through the introduction of logical record-level concurrent update protection and better "thread" scheduling.

The English-like statements of Plex allow users to manipulate their data bases from Host language programs written in Cobol, Fortran, PL/I or assembler. A stack manipulation feature enables the programmer to reduce communication between the application and the DBMS, the spokesman said.

Previously called the immediate access facility, the Query/Update Extension to System 2000 (Quest) capability includes an improved list reporting capability with which users can produce complex reports without the format or procedural commands normally associated with report writers, the spokesman continued.

### Training Changed

Along with updating the capabilities of the DBMS itself, MRI has improved the documentation and the training that accompanies it. The documentation follows a "top-down layered approach" and training now includes a multimedia package in which the learners control the pace of the lessons.

The Universal Software Interface (USI),

also new to System 2000, is a separately priced option designed to simplify the linking of "virtually any proprietary package" or site-developed software with the DBMS. USI allows the user to tailor the System 2000 to special needs with the creation of user-specific dialects of the data manipulation language.

The basic OS version of System 2000 costs \$35,000, but a typical installation will cost \$70,000 to \$80,000 once optional features have been selected. The USI feature, for example, costs \$5,000.

MRI can be reached at P.O. Box 9968, 12675 Research Blvd., Austin, Texas 78766.

## DEC Adds Pascal for VAX-11

MAYNARD, Mass. — A Pascal compiler, developed in conjunction with the University of Washington at Seattle, has been introduced by Digital Equipment Corp. for use on its VAX-11/780 superminicomputers.

Designed for instructional and industrial use, this is the first version of Pascal to be supported by a minicomputer manufacturer, according to DEC.

Pascal is a structured, high-level language that provides a modular, systematic approach to programming and problem solving. The language's facilities for handling complicated data are becoming more widely used by industry in large programming efforts, DEC claimed.

### Reentrant Compiler

VAX-11 Pascal is a reentrant, native-mode compiler that is said to take advantage of the hardware floating-point and character instruction sets and the virtual memory capa-

bility of the VAX/VMS operating system. The product supports standard Pascal capabilities including scalar and structured data types, loop control and conditional statements and I/O procedures, a spokesman noted.

Extensions supported by the DEC software are said to include sequential files of fixed- or variable-length records, a double-precision real data type and a value declaration part.

DEC is actively involved in the standardization effort for Pascal and plans to keep this compiler fully compatible with the standard as it emerges. In fact, the spokesman said, this compiler has a user-selectable software "switch" that flags nonstandard source statements during compilation.

A single-system binary license fee for VAX-11 Pascal costs \$2,500 to nonprofit institutions and \$5,000 to all others, with deliveries expected to begin late this year.

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## DOD Stops Work on 'Red,' Gives Go-Ahead to 'Green'

Special to CW  
WASHINGTON, D.C. — More than four years of work on a triservices common programming language for the Department of Defense (DOD) culminated here May 2 with the selection of a winner.

The Green language, defined by CII-Honeywell-Bull, triumphed in a head-to-head competition with Red, defined by Boston-based Intermetrics, Inc. The Green language will be known as Ada in recognition of the work done by Lady Ada Lovelace, who assisted Charles Babbage.

The Green language emerges from a thorough language definition process. As early as January 1975, the DOD High Order Language Working Group (HOLWG) began gathering requirements for what was to become the Ada language.

The application domain to be served by Ada was "embedded computing." These applications are principally real-time in nature and are more like scientific and systems applications than like DP applications.

Ada is seen as a gradual replacement for several existing triservices languages and is capable of satisfying Fortran-type applications as well. It is not capable of performing Cobol work.

### Test and Evaluation Phase

The selection of Green is also the beginning of the next phase of Ada's development. A shakedown cruise, known as the test and evaluation effort, is now under way. During this phase, the language will be allowed to flex with the needs identified by evaluators who code actual applications in the new language. Upward compatibility and stability, although desirable, is not yet a goal.

It will not be until late 1979 that the results of the test and evaluation phase are formally blended into the language. Then in 1980, a standardization and stabilization phase will begin.

The selection of Green was accomplished by the delivery of a test translator for the language, a language reference manual, some sample Green programs and a formal definition of the language. Training courses in Ada, taught by members of both the Green and Red language design teams, will begin in early summer. They will be attended primarily by test and evaluation phase participants.

### International Flavor

The selection decision was international in flavor. Although most of the members of HOLWG came from DOD agencies, at least three foreign countries including England, France and Germany were represented in the decision process.

Other voting members came from the Army, the Navy, the Air Force, the Marines and the Defense Communications Agency, and included individual key participants who steered the multi-year effort.

Industrial and academic compiler language experts also participated in the selection, either through team critiques of the language or as paid consultants to DOD agencies. During one phase of the selection process, 90 separate teams supplied HOLWG with analyses

of the competitive languages.

The language is complex and powerful. Although it resembles Pascal philosophically, it is a long way from Pascal in complexity. The language is meant for professional programmers faced with sometimes perverse problems.

An Ada program is a sequence of units including subprograms, package modules (for defining clusters of related information) and task modules (for parallel processes).

All data must be declared and given a type. Predefined types include integer, Boolean, character, floating and scaled fixed-point and enumeration. Ada users can also define their own data types.

Compile and runtime systems verify that types are used consistently; only through an explicit Unsafe statement can the user violate these type constraints.

### Executable Facilities

Executable facilities include the latest in structured coding concepts — IF... THEN... ELSE, Case-When, FOR/-WHILE-loop — as well as assignment and subroutine calls. The ubiquitous GOTO is still present, but with limitations.

The parallel processing capability stretches the state of the art of the field. Tasks may be initiated, waited on and rendezvoused in parallel with the program's "main" logic flow. The implications for distributed processing work are obvious.

Language facilities are also provided for exception handling (for example, computation overflows or underflows, or uninitialized variables; machine-specific information for example, data packing or machine code insertions); and generic program units (a form of subprogram capable of generating different object code depending on, for example, the type of data provided. In addition, a fairly unsophisticated level of input/output is provided.

As can be seen, the language is modern in concept and to some degree even daring in its capabilities. The test and evaluation phase will include careful attention to both the traditional and innovative aspects of the language.

Steering the language through its complex development process have been Lt. Col. William A. Whitaker and William E. Carlson of the Defense Advanced Research Project Agency and Dr. David A. Fisher of the Institute for Defense Analysis.



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## 'Vbomp' Claims Faster Run Of 'Bomp/Dbomp' Files

NEW YORK — Faster processing of files created for IBM Bill of Material Processor (Bomp) and Data Base Organization and Maintenance Processor (Dbomp) operations is possible by replacing the IBM software with Vbomp, according to Vbomp's vendor, H&M Systems Software, Inc.

Vbomp replaces all Dbomp calls and runs Bomp/Dbomp files under Vsam. The system supports all disk types, including IBM 3370s and 3310s.

The system is "quite fast," he said. A user reported that loading a master file of 160,000 records required 2.15 hours when Dbomp was used, but only 19 minutes when Vbomp was utilized, he

claimed.

Vbomp is an access method that utilizes each of the free control intervals found in external storage. Neither overflow areas nor physical control intervals need be established, the spokesman explained.

The H&M software also allows users to process Dbomp and Vbomp files within a single program, to define "virtual" devices that do not really exist and to use all macro names and process indicators known to Bomp/Dbomp installation, the spokesman said.

The package costs \$210/mo for batch and \$175/mo for CICS under 36-mo rental plans, H&M said from 40 Rector St., New York, N.Y. 10006.

## Codasyl Seeks User Comments

(Continued from Page 37)

syl. One committee is planning a preliminary journal of development for a common operating system control language; another has produced a report on end-user facilities and how they might be enhanced. Both of those activities will be discussed at the meeting.

Another part of the agenda will be devoted to Codasyl's systems committee's work on distributed network processing. Additional reports will be given by the committee on data description language and by the Cobol committee, according to Jones.

Keynote speaker for the general meeting will be Elmer B. Staats, U.S. Comptroller General. The General Accounting Office report last year on the sorry state of DP standards within the government and a comment in that report saluting the work of Codasyl led Jones to extend to Staats the invitation to speak, the chairman said.

### Session Topics

Codasyl's specifications for a data base management system (DBMS) will be the focus of successive sessions the afternoon of the first day of the conference.

John Cullinane, president of Cullinane Corp., will outline the pros and cons of creating and supporting a "Codasyl-compliant" DBMS, in particular his company's IDMS package. Following that, Thomas Nies, president of Cincom Systems, Inc., will discuss the pluses and minuses of following a non-Codasyl path, as he has done with the Total DBMS.

Mayford Roark, executive director of Ford Motor Co.'s systems office, will present a case study of an implementation of a distributed processing system using minicomputers. Secretary of the Navy William E. Clayton Jr. will also be a featured speaker.

The report on distributed systems will be given by William H. Stieger of Standard Oil Co. (Ohio). Stieger is chairman of Codasyl's systems committee. Michael O'Connell of Digital Equipment Corp. will report for the data description language committee, and consultant Henry Lefkovits will discuss end-user facilities.

Information on registration is available from Nonnie Robertson, Guest Services, Honeywell, Inc., 7900 Westpart Drive, McLean, Va.

## 'Manman,' 'Finman' Adapted

LOS ALTOS, Calif. — The Manufacturing Management (Manman) and Financial Management (Finman) packages, originally written for use on Hewlett-Packard Co. HP 1000s, have been adapted to run on HP 3000 minicomputers, according to the vendor, ASK Computer Services, Inc.

Intended for people with little or no DP experience, the interactive Manman 3000 system consists of six modules: inventory control, bill of materials processing, material requirements planning (MRP), purchasing, work-in-process and capacity planning and product costing.

The MRP module in this system performs level-by-level, time-

phased, regenerative, gross-to-net pegged requirements explosion for all actual customer orders and forecast requirements for products, assemblies, spares and maintenance parts, an ASK spokesman said.

The modules are integrated via a common data base that uses Image, HP's data base manager, he added.

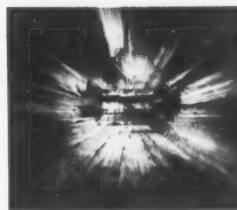
Finman 3000 comprises four modules: order entry, accounts receivable, sales analysis and accounts payable.

Manman costs \$50,000 and Finman, \$25,000, when purchased separately. Discounts are available when the packages are bought in conjunction with HP 3000 systems.

ASK is at 730 Distel Drive, Los Altos, Calif. 94022.

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CW514

# IFA Can Spot Flaws in Existing System Logic

By Stephen L. Robinson

Special to CW

Over the last couple of years, several of my former colleagues and I have written about a type of study called an information flow analysis (IFA). As noted in earlier columns, an IFA is an inventory-taking procedure designed to identify the sources, usage and disposition of an organization's data and information resources.

What has not been stressed, however, is that an IFA, in addition to serving as a major component in a study for a future data base system, can often identify major problems in existing sys-

tems logic.

Consider the following, which came from an actual IFA study.

The setting for this IFA study is an old, established manufacturing company (anonymous for reasons evidenced later in our tale). Long years of high profitability had given way to a rapid decline in revenue and profits.

Hoping for answers, the company began to search through management reports, only to find no two reports seemed to agree on many key items (e.g., inventory levels, sales figures, production statistics and so forth).

As a first step in revising the company's approach to data and information, I recommended an IFA study. The skepticism of several DP executives was overruled from the top, and

so we were given authority to proceed. Recognizing full well that we were on the spot, we debated where to start.

## Rapid Solution

This early problem was rapidly overcome when one of the unmarried male members of our team spoke out eloquently for the rationale of starting at the beginning of the order cycle — in a room with several comely clerks who accepted telephone orders.

We observed one such clerk filling out the order form. Immediately following the telephone call, she separated the multipart, multicolored form into seven pieces, filed some and placed some into an out basket for further distribution and processing.

After waiting patiently for the inter-

nal mail pick-up, we saw a messenger come around, pick up the forms and depart. We followed closely behind.

Finally, in an office that reeked with age, the messenger dropped off two parts of the multipart order form. We introduced ourselves to the wizened inhabitant of the office who regarded us with disdain reserved for consultants, who also were Northerners, who also were more than 20 years younger than he.

A quick glance at the order forms distressed our senior clerk, who promptly took eraser to paper and changed something on the order form. We practically jumped on him. "What did you do?" we asked in unison.

The old gentleman assumed his patient voice and explained that this was an order from the ABC Co., and it always ordered Size 5 widgets, not Size 6 as the order clerk had recorded. "Are you sure?" we asked.

"I've been here for 40 years," the gentleman said. "You've been here for 40 minutes. Of course, I'm sure; check with Charlie at the ABC Co. if you don't believe me."

Needless to say, we checked with Charlie; needless to say, our aging (but still sharp) new friend was correct — Size 5, not Size 6. Somewhat triumphant he showed us out of his office.

We asked one of the company's analysts, "Who, in addition to this gentleman, has authority to change documents?"

Somewhat shamefaced, he answered, "Anyone with a pencil."

## Maintenance Unsynchronized

Over the next several months, we verified his observation. "Maintenance" of forms and reports was totally unsynchronized. No wonder reports never agreed. A master plan was drawn up to control the flow and integrity of forms, reports and files.

Not that this solved all the company's business problems overnight. Far from it. There are many production, marketing and organizational problems still getting attention. What was accomplished, however, was the development of an effective information system, which has proven invaluable in identifying the true nature of the company's problems.

Unsynchronized maintenance of multipart forms, or of reports that have been fed through your friendly copier and distributed to 20 different departments, is perhaps the single greatest problem in data and information flow, with the possible exception of gathering and recording accurate data. The latter problem will be addressed in a future column.

Robinson is an independent consultant, operating as S.L. Robinson & Associates, based in Morrisville, Pa.

## Advanced Concepts in Data Management

In addition to being the most comprehensive data management system, DMS/OS performs functions never available before. It is easy to install, easy to use and, most of all, PRODUCTION PROVEN. None are more enthusiastic about DMS/OS than the companies that rely on it.

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Steve Zee  
St. Regis Paper

"Since we began using DMS/OS, we have gained about 22-23% more free space. We are gaining space, and at the same time, we are still adding files. I am sure I would need at least one more person on my staff, if I did not have DMS/OS."

Tom Moulder

Zale Corporation

"We evaluated a lot of other DASD software packages, however they were not global enough for our needs. All the other packages seemed to specialize in certain areas. DMS/OS specializes in all areas of DASD Management."

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# ITEL

## Package Manages 3/15 Disks

CYPRESS, Calif. — The Disk Management Facilities Package (DMFP) now available from Pacific Computer Systems consists of several general-purpose utilities for file and Volume Table of Contents (Vtoc) manipulation on IBM System 3/15D configurations.

The package was designed especially for users of the Communications Control Program (CCP) with Model 2 screens. It consists of an on-line Vtoc display program and another utility to display and update records of any main data area file, according to a spokesman.

Written in RPG-II with assembly language subroutines, the CCP utilities are all Program Request Under Format routines which reside on

disk until they are required in main memory. Despite the disk-memory transfer, the routines provide very fast response times, the vendor claimed.

In addition to the CCP support programs, a batch-oriented utility prints a combined Vtoc of all 3340/3344 main data area files currently mounted. This listing may be in user-specified order and is particularly useful because it flags all files that are using 80% or more of the space allocated for them.

The complete DMFP costs \$500, but the component programs can be acquired separately. More information is available from Pacific Computer Systems at P.O. Box 1055, Cypress, Calif. 90630.

## 'Supertab' Builds, Stores Graphic Models on Net

DALLAS — Supertab, an interactive graphics system for finite element modeling, is now available through the remote computing service facilities of University Computing Co. (UCC).

Developed by Structural Dynamics Research Corp., the software interfaces with both Nastran and Ansys, engineering programs that have been available to UCC users for a number of years. Supertab enables an engineer to create, view, rotate, change, correct and manipulate a three-dimensional finite element model.

In addition to the viewing and two- and three-dimensional digitizing capabilities of earlier versions, Supertab now supports automated mesh genera-

tion, which gives the user the ability to create data files of a model in a fraction of the time previously needed, a spokesman claimed.

With a control language including more than 80 commands and a library of conventional and isoparametric finite elements, Supertab is said to reduce modeling costs and total design time by as much as 75%.

Supertab was designed for use on standard Tektronix, Inc. 4010/4016 graphics terminals as well as the newer Tektronix MEG series equipment, according to UCC's product manager at 1930 Hi Line Drive, Dallas, Texas 75207.

## 'Actmon 1' Tracks Honeywell Programs

NEW YORK — A "very generalized" software monitor now available from Advanced Computer Techniques, Inc. (ACT), Actmon 1 is capable of tracking programs on Honeywell, Inc. Level 66 mainframes regardless of the language in which they were written.

The package's handling of single-phase programs is very similar to that of other monitors, including monitors supplied by Honeywell. At user-specified time intervals, it records what part of the program is being executed and at the end of the recording period generates a histogram showing the cumulative percentage of time spent in each area.

But Actmon 1 is in a class by itself in monitoring programs involving overlays, a spokesman claimed. Although most monitors cannot tell which overlay is being executed when there is activity in an area of memory used by several overlays, Actmon 1 can and does provide this "obviously important" information, he explained.

The package costs \$8,000 plus consulting fees, ACT said from 437 Madison Ave., New York, N.Y. 10022.

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## May Expand Companywide System DEC Succeeding With Electronic Mail

By Ronald A. Frank  
CW Staff

MAYNARD, Mass. — A terminal-based electronic mail system (EMS) at Digital Equipment Corp. is changing the way people communicate with each other within the company, according to Bob Erickson, manager of corporate message systems.

The EMS is being implemented strictly as an in-house system to evaluate the benefits of electronic mail, Erickson said in a recent interview, stressing that he has run the system from the standpoint of being a typical business user rather than a DP vendor. Others are studying whether this should become a DEC product, he said.

The pilot EMS project was begun last spring and now has about 750 users at various DEC sites in the U.S. and Europe. The

system runs on a PDP-11/70 here, which has 300M bytes of disk storage and it is based on the Comet mail system software from Computer Corp. of America (CCA) in Cambridge, Mass.

One of Erickson's biggest problems is that the system has caught on so fast he has a "waiting list" of those who want to get on it. Management is now evaluating the initial EMS results and will soon determine whether to continue and expand it, he explained.

Despite the fact that EMS has exhausted its available storage and cannot accommodate new users, Erickson does not believe users should be concerned about how much memory they utilize. This would inhibit frequent use, he implied.

EMS can be accessed via a variety of terminals including CRTs, teleprinters, portable

terminals and Telex machines, he said.

Most of the current user group (which was selected at random) is in the management and executive category. These users total almost half of those now on the system. Next are professional staffers who represent about 30% and office/clerical users who represent about 18%. Very few technicians, sales personnel, craftsmen and service workers use the system.

Based on initial tests, Erickson estimates that the average EMS user is about 5% more efficient in his job because of the switch to electronic mail. He admits that this number is far from a scientific conclusion but rather is based on a survey of EMS users.

The majority of the users access EMS via CRTs and use it for short informal two- to three-line memos that otherwise would have been written on paper.

As a result of having the system, phone calls have been reduced and the number of interoffice memos has decreased, the user survey showed. But meetings have stayed about the same, along with business trips. Erickson sees this as an indication that electronic mail can replace certain communications but should not be considered a substitute for situations that require face-to-face human interaction.

### Psychological Impact

Some of these results appear to have psychological implications and Erickson is planning to bring some corporate behavioral science staffers into the project to help evaluate the survey findings. The behavioral issues associated with this type of system are important but little is understood about them, he said.

(Continued on Page 44)

## Keep an Open Mart in Future, Ex-FCC Chairman Tells Users

By Don Leavitt  
CW Staff

OKLAHOMA CITY, Okla. — DPs and equipment manufacturers have three basic interests to be considered in the coming decade by Congress, regulatory agencies and government bodies as diverse as the U.S. Postal Service (USPS) and the Justice Department, according to attorney Richard E. Wiley.

Chairman of the Federal Communications Commission (FCC) until he resigned two years ago, Wiley said both users and providers need continued freedom from regulation, high-quality communications lines at reasonable costs and the assurance that communications common carriers can't exploit their unique positions in anticompetitive ways.

Keynoting the recent 1979 Southwestern Computer Conference here, he said, "keeping track of the players, the issues involved and their interrelationships" is a full-time task. But keeping track is important in trying to evaluate the potential impact of any of the rewrites of the Communications Act of 1979 that are now under consideration, he added.

All the proposals demonstrate an intent to protect the interests of the users and providers, but whether they ultimately will achieve that goal is another question, according to Wiley. While pending legislation is significant, the possibility of revising the 1956 Consent Decree under which AT&T is prohibited from engaging in "nearly all activities except regulated communications"

must also "provoke considerable debate."

Whatever happens to the Consent Decree, however, it is clear that technology is blurring the distinction between DP (now "regulated" by the marketplace and the antitrust laws) and data communications (now pervasively regulated by the FCC), Wiley noted.

### Need for Policies

This technological fact of life requires the government to make some fundamental policies, he told the 800 attendees.

The alternatives are:

- To allow both DP and data communication

(Continued on Page 44)

## POS Terminal Series Debuts

PINE BROOK, N.J. — The Sweda International division of Litton Industries has introduced a series of microprocessor-based point-of-sale (POS) terminals designed to allow for future technology upgrades.

Called the L-70 family, the terminals can be configured with specific features required by food, retail or other POS users. A range of "peripherals" will be available with the L-70 includes scales, printers, displays and readers for the Universal Product Code, optical character recognition (OCR) font OCR-A and credit cards.

Up to 15 terminals can be connected into a system and one can be designated as the master station, thus eliminating the need for back office terminal control if desired, the company said.

The terminal includes a 16-bit micropro-

cessor and is available with five keyboard variations depending on application. In addition to detailed sales breakdowns, the terminal can be programmed to provide operator productivity information, sales figures and inventory data. Cassette, floppy disk and mass storage is available depending on requirements and the L-70 can operate on-line in binary synchronous mode with an IBM CPU, a spokesman said.

Future upgrades include an expected 256K bubble memory (slated for mid-1980) and an enhanced microprocessor. Prices for the L-70 will range from \$2,700 to more than \$5,000 with first delivery set for the spring of 1980.

Sweda is located at 34 Maple Ave., Pine Brook, N.J. 07058.

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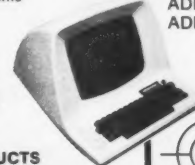


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## Also Gets Expanded Storage IBM 3624 Enhanced With Multiline Display

WHITE PLAINS, N.Y. — IBM has added a multiline display enhancement to its Model 3624 Consumer Transaction Facility.

The display enhancement for the automated bank terminals shows six display lines of 40 characters each, providing more information and instructive messages than possible with the present single-line display. It offers more transaction flexibility, such as single-key cash withdrawal, deposit with cash back and electronic bill payment, IBM added.

The 3624's financial institution table can be expanded to allow the keys and processing options to be defined for individual institutions and/or card types in a sharing environment, a spokesman noted.

Facilities included with this enhancement provide flexibility to customize transactions to meet the individual institution's requirements. Additional interactive functions allow expanded communications between the user and the system, IBM said.

### Storage Expansion

IBM also introduced a storage expansion feature, No. 6501, to increase the storage available with the 3624 when the multiline display feature is installed. Both enhancements can be field-installed, the spokesman indicated.

System control programming support for the multiline display feature will be available at the time of the first customer shipment, planned

for next February, with field installations set for May 1980.

Since the multiline feature is field-installable, the move to a multiline 3624 can be a staged process, the spokesman noted.

To modify the 3624 to the multiline version, it is necessary to reformat system and

application messages so the number of display characters per line does not exceed 40 and reformat the messages using the multiline format and segment control characters.

In addition, any character not contained in the defined font sets must be deleted.

The multiline display can be purchased for \$1,200 and leased over a five-year term for \$46/mo. Monthly maintenance costs \$9.50. The storage expansion feature can be purchased for \$420 and leased for \$12 mo; it has a monthly maintenance fee of 50 cents.

## Keep Open Mart, Users Told

(Continued from Page 43)  
tions to be regulated by market forces.

• To regulate pervasively both offerings.

• To maintain some distinction between the two so that DP remains free of regulation, while data communications remains subject to it "at least until other ways of protecting the public are devised," Wiley said.

### Wiley's Preference

His own preference would be to rely to the greatest extent possible on competition. "Indeed the government should attempt to create an environment in which existing competition can be preserved."

"Although far from a perfect solution, I believe the FCC should continue to require a

common carrier (or at least a monopoly supplier) to provide noncommunications services through a separate subsidiary. In addition, federal policy should foster the opening of markets previously dominated by monopolies and oligopolies to increased competitive forces."

In that regard, he said, the FCC ultimately will have to conclude that the terminal equipment market should be totally deregulated.

### Regulatory Questions

Shifting to the operations of another government body, Wiley said the moves by the USPS to get into Electronic Computer-Originated Mail (Ecom) raises a range of regulatory questions. Can the FCC regulate the USPS? What is

the effect of the post office monopoly over certain kinds of mail?

If Ecom becomes a reality and the USPS attempts to bring Ecom within its legal monopoly over "letters" and "packets," such a move would "violate a long tradition of wise public policy and in the process threaten to stifle or eliminate many of the benefits now available to us through competitive private enterprise," Wiley warned.

Because of the impact any one of the Communications Act rewrites might have on their operations, he urged conference attendees to write to Rep. Lionel Van Deerlin (D-Calif.) or Sen. Ernest Hollings (D-S.C.) to learn more about the bills and to express their opinions on their provisions.

## DEC Scores Success With EMS

(Continued from Page 43)

The average EMS user logs into the system three times a day and spends about 25 minutes on the terminal. Most people can learn how the system works from manuals supplied by the EMS group, but when necessary, this can be supplemented with less than an hour of training, he said.

Since usage tends to increase after a person begins to use EMS, the terminal system is apparently not regarded as a novelty but is looked on as a time-saving effort. Some managers access the system from home using portable terminals, and these users often spend an hour a day on EMS, Erickson explained.

For European sites, EMS uses both transatlantic Telex lines and packet facilities from Tymnet but the carrier facilities are transparent to the user. Because he can get equipment at a lower cost than another user, the system costs about \$25/mo per user compared to the CCA charges for Comet, which are \$60/mo for time-sharing access, he said.

The real key to making EMS efficient is to allow the use of terminals for other communications nets within the company. This is now being done and will help to drive down the cost. Even though relatively few companies are us-

ing internal EMS systems, Erickson believes that within five years, "EMS will be as common as the phone."

Features that EMS users would like to see added to the system include improved editing, a "return receipt" when a message has been "delivered,"

a directory of those on the system and a "calendar capability" to help schedule time. In addition, Erickson's group is exploring the feasibility of gateways to other systems such as word processing and store-and-forward message systems.



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# TEXAS INSTRUMENTS.

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# Supermarket EFT System Lets Client Do Work

By Jay Woodruff

CW Staff

KANSAS CITY, Mo. — Since the installation of a minicomputer-based electronic funds transfer (EFT) system with microcomputer-based CRT terminals, a supermarket chain here has pleased its customers by letting them do the work.

"It saves us a tremendous amount of labor as far as having a courtesy booth or checkout lane is concerned," according to Frank Peak, vice-president of DP at Milgram Food Stores, Inc.

The system has been running since last October. All transactions except for cashing a check or making a deposit to one of the five savings and loan associations hooked into the system are handled by the customer.

"It gives us a lot of flexibility," Peak said. Milgram, the system's first user, has just finished installing terminals in its two newest stores, bringing the number to 70 terminals in 42 stores.

"We can do check authorization on all our customers, and it allows us to tailor our check-cashing policies to the individual customer," he explained.

## Driven by a Chip

The supermarket EFT system was designed by Financial Automation, Inc. of St. Louis, Mo. Each terminal that Milgram uses is driven by a 12K-byte microcomputer chip programmed to interact with the customer to keep the transaction as simple as possible.

The micro also drives the printer that endorses customer documents, the card reader and the keyboard at each site and handles communications to a Data General Corp. Eclipse C330 minicomputer located at Milgram's computer center.

The terminal, made by Financial Automation, is reportedly the only one in its price range with a 9-in. CRT, making it easier, especially for older customers, to see the instructions that are flashed on the screen to prompt them through the transaction. The typical cost (in volume) of the unit is \$2,400, the company said.

To avoid confusing the customer with "a big panel of buttons and lights to light," Financial Automation developed a series of menus to select that assist in making a smooth transaction, a spokesman said. Adjustments in software can easily be made by down-line loading them into the terminal's microcomputer.

## Terminal Network

The terminal network is controlled by the minicomputer over a 1,200 bit/sec asynchronous line. Each terminal has its own modem so each store having more than one terminal won't be completely shut down by a modem failure.

Housed at Milgram's computer center, the minicomputer uses bisynchronous lines to the savings and loan associations, while communication between the terminals and the DP center is asynchronous. The protocol between the switch and the minicomputer allows large blocks of data to be down-line loaded and interspersed with transactions.

The special protocol was required because "if there were a power failure, the terminals could get polled again. They could ask for their programs, and we have to be able to load them on the fly," the spokesman said.

On-line diagnostic routines between the terminal and peripherals as well as memory tests are included in the read-only memory (ROM) section of the

microcomputer, obviating the need for on-line diagnostic routines, he added.

## Growing Pains

The system has not been without growing pains, although they were characterized by Financial Automation and Peak as the kind of thing to be expected in a system that had not been implemented before.

Financial Automation mentioned "communications line hang-ups when the volume starts building up," while Peak said he understood the major problem to center around software. "It's a matter of making the system do exactly what we designed it to do. Like any new computer application, when you bring it up, you're going to have problems here and there," he observed.

Milgram acts as the switching point between its terminals and the savings and loan companies.

Four loop lines go out to the stores with a fifth line that latches the mini to a host computer at Farm and Home Savings and Loan, one of the five associations offering services to Milgram customers.

## Processing for Four

Farm and Home does all transaction processing for the other four institutions. Milgram's CPU from DG routes savings and loan transactions to Farm and Home's CPU, which processes and returns the message to Milgram. It then forwards it back to the customer using the terminal, Peak noted.

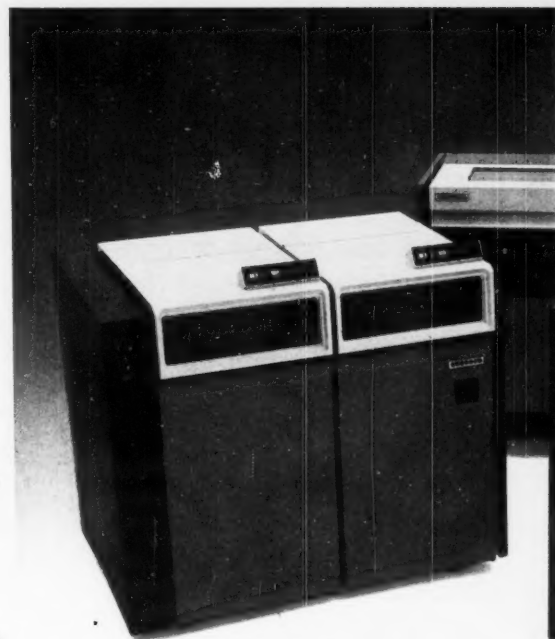
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Thanks to CalComp, you've finally got a single, solid source for all your IBM peripheral needs. ☐ No matter how big. Or how small. ☐ And now, the bad news.

There's not much. But it has to be said. ☐ With so many attractively priced, performance-oriented CalComp peripherals to choose from, IBM peripherals have never looked less impressive. ☐ Take our 4800 I/O set for example. The set's controller is microprocessor-based and smaller than IBM's 2821. Our line printer is smaller than IBM's 1403N1, too, by almost 50%. And a full 100 lines-per-minute faster. ☐



## Sequencer Works Automatically

MONTGOMERYVILLE, Pa. — A general-purpose communications terminal sequencer that automatically transmits data from RS-232C-compatible devices over communications lines is now available from Transaction Management, Inc.

Called Comseek, it provides automatic remote sequencing of data transmissions located up to 2,000 ft from the unit. It was designed to transmit data from a remote and unattended cluster of terminals such as point-of-sale terminals in a branch store or inventory control terminals in a warehouse.

The unit is available in two models, with either four or eight input ports that can be connected together in a daisy-chain pattern to

serve as many terminals as necessary. It also functions as a line driver to permit greater cable lengths between terminals, according to the company.

Comseek accommodates transmission rates from 300- to 4,800 bit/sec and works in either synchronous or asynchronous modes. It is typically connected to an external self-answering modem.

Comseek, with its 120V to 140V 50/60 Hz power supply, is self-contained. The unit weighs less than 20 lbs and measures 13.3- by 11- by 4.3 in.

The four-port version costs \$800 and the eight-port model \$950 from Transaction Management, Rt. 309, Montgomeryville, Pa. 18936.

## CDI Portable Terminal Gets Bar Code Reader

BURLINGTON, Mass. — An integral alphanumeric bar code reader for Computer Devices, Inc.'s (CDI) Model 1206 programmable portable terminal is now available.

The reader allows 1206 users to enter Code 39 alphanumeric bar code data via a hand-held wand in a variety of point-to-point transactions and data collection applications, the company said.

The bar code reader was designed especially for sales and inventory operations where data entry accuracy is critical.

Because the Model 1206 can be programmed to prompt operators through data collection/preparation proce-

dures, it can be operated with no special training, CDI said.

The Model 1206 with the bar code reader brings the advantages of distributed data processing out to customer offices and out from the warehouse to those stocking shelves, a CDI spokesman said.

### Ten-Foot Cable

The wand is equipped with a 10-ft cable and connects to the terminal with a five-pin plug. The reader is priced at \$850. Leases are \$42/mo on a one-year term.

More information on the reader or the Model 1206 is available from CDI at 25 N. Ave., P.O. Box 421, Burlington, Mass. 01803.

## Carrying Cases Hold Terminals And Accessories

HOPKINS, Minn. — A line of carrying cases for terminals designed to hold terminal, keyboard, cables and accessories was introduced here by Sportcase, Inc.

The case opens on its side and has an upper shelf for cables and literature. A special three-handle design for weight distribution allows the case to be carried by either one or two people.

Unit frame construction is used and every piece of hardware, including lock, handle and hinge is riveted through the plastic and into the aluminum valance for greater strength, the company claimed.

### Cushioned Inside

The carrying cases use ABS plastic and are coated for scuff resistance. The inside of the case is cushioned with protective foam to eliminate content damage and secure the terminal in place.

Prices vary according to size. The unit measuring 19- by 21- by 16 in. is priced at \$140 from Sportcase at 610-13th Ave., Hopkins Minn. 55343.

## AT&T Alters Prices Of Dataspeed 4540

NEW YORK — AT&T has issued a revised price range for the Dataspeed 4540 terminal [CW, April 30].

A typical cluster of three CRTs with an 80-col. printer is expected to cost \$600 to \$700/mo when tariffs are filed later this year, a spokeswoman said.

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## June Conference Slated on X.25

CARMEL, Calif. — A two-day conference on the X.25 packet mode interface and related Consultative Committee on International Telephone and Telegraph (CCITT) international standard protocols for packet networks will be sponsored here June 20-21 by Telenet Communications Corp.

The conference is designed primarily for computer and terminal manufacturers that are developing X.25-based products for use on public and private data networks.

Peggy Karp, director of product engineering at Telenet and an authority on CCITT packet network protocols, will be

the principal lecturer. Don Weir, a key designer of the Datapac packet network at Bell Canada and now Telenet's manager of software control, will assist Karp.

The June conference, to be held at the Highlands Inn, is the second in a series of four similar conferences on X.25 sponsored by Data Communications. It will be repeated on Sept. 26-27 in Washington, D.C., and Nov. 29-30 in London.

Registration costs \$395. More information is available from McGraw-Hill Conference Center, 1221 Ave. of the Americas, New York, N.Y. 10020.

## Mid-Distance Modem Runs at 4,800 Bit/Sec

NEWPORT, R.I. — Avanti Communications Corp. has announced the Model 3002 synchronous medium-haul modem, designed to operate at 4,800 bit/sec at distances from 50 to 100 miles on four-wire dedicated and unconditioned lines, loaded metallic circuits, carrier systems and microwave and multiplexer systems. A fallback rate of 3,600 bit/sec

is said to provide reliable operation when lines become marginal. Operating modes are full-duplex on four wires, half-duplex on two or four wires, point-to-point and multipoint.

Local and remote loopback capability and diagnostic LEDs facilitate installation and checkout. A dual-channel option allows two terminals to operate independently at 2,400- or 1,800 bit/sec with a single modem.

### Asynchronous Option

An asynchronous option allows either a single 4,800/-3,600 bit/sec or dual 2,400/-1,800 bit/sec terminal to be connected directly without external asynchronous-to-synchronous converters, Avanti said.

The unit was designed with data published by Bell Telephone Co. on impairments found in telephone lines and has been tested successfully over distances in excess of 100 miles, a spokesman claimed.

The Model 3002 is priced at \$1,350. Avanti can be reached at P.O. Box 205, Broadway Station, Newport, R.I. 02840.

## Able Introduces Multiplexer To Replace DV11

IRVINE, Calif. — Able Computer Technology, Inc. has announced a synchronous/asynchronous multiplexer that it claimed gives users of the Digital Equipment Corp. PDP-11 minicomputer greater application flexibility than is available with DEC's DV11.

The DV/16 has 16 channels on four hex-width boards; in comparison, DEC's multiplexer requires a nine-slot mounting model. In addition, the Able model uses word transfer instead of byte direct memory access (DMA) to either gain a 2:1 speed advantage (76,800 char./sec) or let the user operate in one-half the bandwidth required by DV11 asynchronous data transfers.

With 16 channels, the DV/16 costs \$10,500 from Able at 1751 Langley Ave., Box 18162, Irvine, Calif. 92714.

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More good news. The VA3434 is compatible with Racal-Vadic's VA3400 Series, including the VA3467 computer site triple modem.

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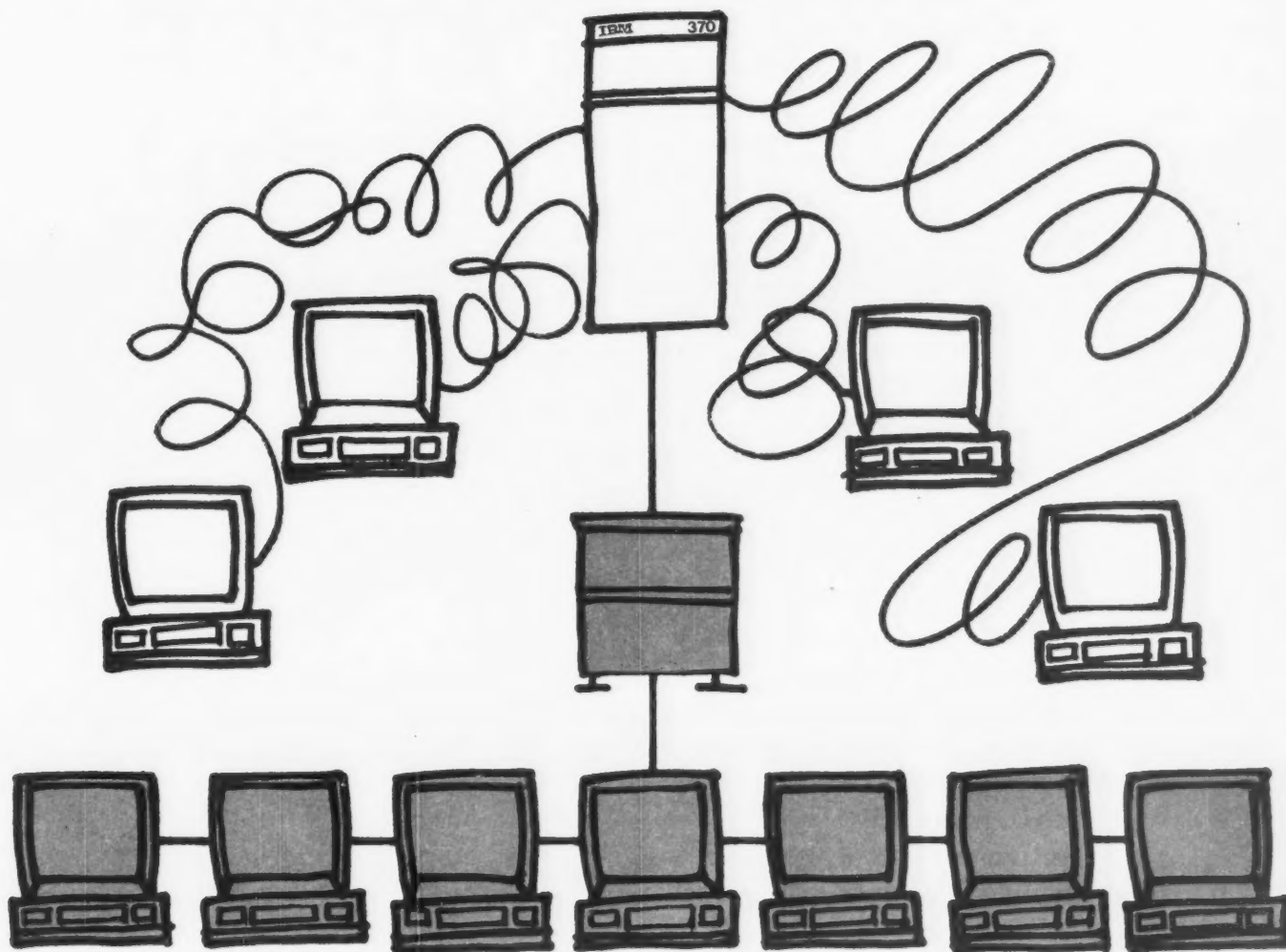
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## User Gets 'Data Entry MIS' Operation

By Douglas L. Harmon  
Special to CW

LOS ANGELES — Can a management information system (MIS) department staffed only by data entry operators performing only data entry-level functions be successful in meeting the information requirements of a large and complex organization.

This was the question inherent in the requirements that Planning Research Corp.'s (PRC) Data Services Co. received from a customer during the conceptual design phase of an integrated MIS. The customer in question has an East and West Coast facility, each of which is organized into 10 departments spread out in a number of buildings over several acres.

Because of previous abortive attempts at MIS, financial constraints and a general conservative philosophy, the company wanted to ascertain that DP would significantly enhance its operations before committing itself to very large hardware, software and personnel costs.

This conservative approach by our client led us to design a seven-module MIS to be hosted on a national time-sharing service, sophisticated enough to handle current and

projected requirements, yet simple enough to be operated by lower level DP personnel. Tymshare Corp. was selected as the host vendor in order to take advantage of the Tymnet communications facilities.

Tymshare also offers the Focus data base management system on its IBM 370/158 mainframe and we wanted to use Focus's power and flexibility in building and maintaining the MIS data base. Tektronix, Inc. 4025 terminals were selected for host communications and data entry.

The personnel and organizational requirements were addressed by selecting one middle-level manager from each department to be the MIS liaison. Each of these managers was assigned a data entry operator to enter the department's data, schedule processing and request reports from the system.

### Basic Requirements

The lack of systems and programmer personnel in the client organization demanded that two fundamental principles overlie all other processes during system design and implementation: that each and every input (data or command) be thoroughly edited and validated; and that software be placed be-

tween the user and the OS/DBMS so that the user could invoke the system with an absolute minimum of effort and complexity.

Features of the Tektronix 4025 allowed us to begin applying these two principles at the very onset of any interaction with the system. Using rulings font, alpha font and graphics, the 4025 can be programmed to generate and display a facsimile of any paper form. In addition, the data entered onto the form can be automatically edited for data type and length.

We decided then that any of the three phases of system operation could be initiated through the use of the 4025 form fill-out mode. This also allowed us to design forms that would be easy to use and understand and let the "buffer" software convert it to OS/DBMS terms.

Since we were producing a production  
(Continued on Page 56)

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"Stretching the DP Dollar" will be the theme of a forthcoming *Computerworld* special report. We'd like to hear about the methods you've used to stretch your DP budget — or the problems you've encountered in trying to do so — so we can share them with other readers. Remember, the dollars others save could be your own.

All contributions should be typed, double-spaced and about four or five pages long. Send them to Howard A. Kerten, *Computerworld*, 797 Washington St., Newton, Mass. 02160, or call him at (617) 965-5800.

## Intel AS/5 Model 5's First User Finds IBM Software No Hassle

By Jay Woodruff  
CW Staff

FORT WORTH, Texas — The first user of an AS/5 Model 5 — Intel Corp.'s plug-compatible answer to the IBM 3031 — has reported a trouble-free installation and complete compatibility with all the software used on the IBM machines it replaced.

The City of Fort Worth brought the system in to replace two 2M-byte IBM 370/145 CPUs that ran all the city's on-line police and municipal court applications. When the decision to buy from Intel was made, CPU response to police calls had begun to exceed 5 sec, and more power was mandatory, according to DP Director Charles W. Cox.

And power they got. The AS/5 Model 5 — also known as the AS/7031 processor — reduced response time to 2 sec or less on most of the city's teleprocessing applications, Cox said.

The AS/5 was picked over the 3031 in

competitive bidding. "The \$105,000 difference in cost was the determining factor in our selection," the DP director recalled.

The DP center is located in a city of 600,000 and includes 190 on-line terminals from IBM, Memorex Corp. and Genesis One Computer Corp. Users have access to 118 data files and nearly 2,000 programs.

"What has been most impressive about the AS/7031 is its ability to satisfactorily support both versions of our production teleprocessing systems," Cox said. The processor not only handles the two systems, but can concurrently run a test teleprocessing application and a batch partition without diminishing response time, he added.

The director is happy both with the system's performance and with the lack of installation problems. The company took extra steps to alleviate system response time until the 7031 was installed.

(Continued on Page 52)

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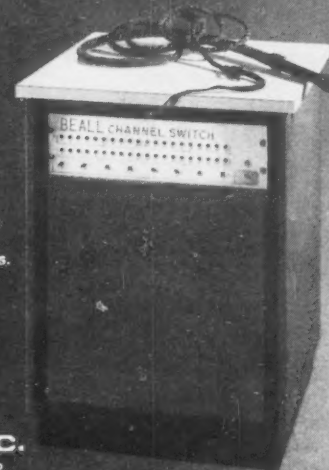
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# System Halves Support Checks' Delivery Time

SAGINAW, Mich. — An on-line computer system has helped the Saginaw County Court cut administration costs and halve the amount of time it takes to get child support checks to recipients.

Since the system was installed almost three years ago, it has more than paid for itself in the Office of the Friend of the Court of Saginaw County. An administrative arm of the county court system, the office plays a role in every divorce case that comes before the court involving minors and is responsible for seeing that court-ordered child support payments are met.

"Before we installed the system, we got 80% of the checks out of our office within five working days, which we thought was pretty good," Thomas L.

Kaczmarek, Saginaw County Friend of the Court, said. "But now we process 99% of all payments within three days. And, because we have an on-line system, we can instantly display any case record on our CRT. This helps the office staff answer inquiries quickly and also gives them immediate aid in resolving problem situations."

In addition to speeding up the payment process, the system has enabled the office to save the salaries of five to 10 people, Kaczmarek estimated. The hardware used by his office — five 3270 CRTs and an IBM printer — is connected to the DP installation run by the City of Saginaw. The mainframe there is a 512K-byte IBM 370/135, running under DOS/V5; the court office has a three-year contract with the city to buy its services.

## Away With Tubs

Before installing the system, the court kept its support records on payment cards, which were filed in large

tubs. Each payment had to be posted on the cards, and the staff had to spend a lot of time pulling cards for posting and then refiling them. Last year support payments totaled approximately \$8.1 million for 10,400 cases, Kaczmarek recalled.

One reason for installing the system was state and federal reporting requirements for the aid to dependent children program, which require a good deal of detailed information to be filed on magnetic tape.

When Michigan instituted the requirement, "It would have required five or 10 people to fill out forms. That seemed the right time to streamline our

entire operation."

Kaczmarek needed some time to adapt to the computer system. "It was real confusing for a while because we had to continually update information in a lot of the records and add on cases. We also had to correct some of the keypunch errors from the original conversion."

"It wasn't hard learning how to use the system, but as far as learning all the screens that came up on the CRT, we had a pretty hectic initial six months. However, our employees adapted pretty well after that, and our volume of incoming work has increased tremendously."

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## No Problems, Itel User Says

(Continued from Page 51)

Although the contract called for delivery no later than Jan. 15, the city had a more urgent need for the more powerful system. It was "unexpected and unanticipated" when Itel agreed to install a less powerful machine for the interim, an AS/5 Model 3, to alleviate the response-time lag experienced with the Model 145.

"We welcomed the opportunity," Cox said. "We were in a power bind, and it was really nice that we were able to use the machine."

The DP director called both the Itel Model 3 and Model 5 systems, which use IBM's CICS teleprocessing monitor, "truly plug-compatible" and described the installation process as essentially one of "unplugging one machine and plugging in the other."

## Three Categories

The city's DP activities are divided into three parts: city courts and police; financial accounting, vehicle maintenance, traffic engineering and tax and water utilities, which also use teleprocessing; and testing of another teleprocessing system.

When the city used the two IBM CPUs, the first and second activities were allocated to the first and second computer systems with shared peripherals.

Now the first two activities are handled by the AS/7031. The 370/145 was retained for backup of the police and court applications, as well as for teleprocessing testing, according to Cox.

Since its installation, the Itel has run without problems and has proven totally compatible with all software used on the IBM systems it replaced, he reported. Itel personnel "have provided the added benefit of working with us on any problems we might have with other vendors' hardware or software."

Some of the extra room available in the AS/7031 is being used by the city DP staff, which is currently developing an integrated payroll and personnel system and a central geographic base file.

## Readers Built for OEMs

IRVINE, Calif. — True Data Corp. has introduced a series of OEM medium- and high-speed card readers that can read both conventional punch cards and mark sense cards.

The Model 300 and Model 800, designed for both mainframes and minicomputers, are based on a patented feed mechanism that is said to result in design simplicity and a minimum of moving parts, thus providing more reliable operation.

The Model 300 is a 400 card/min reader for 80-col. cards, while the Model 800 is available in both 600- and 1,000 card/min versions. All the readers' electronics are con-

tained on a single printed circuit board, and the read mechanism is optically based, a spokesman said.

The smaller unit has stackers and hoppers that hold 500 cards, while the larger unit stacks or holds 1,000 cards. Cards can be loaded and unloaded while the unit is operating.

The Model 300 costs \$1,657.50 each and the Model 800 is priced at \$2,112.50 each in quantities of 100 to 249. Mark sense readers cost 2% more than these prices, while combination mark sense/punch card units cost 8% more. All units come with a 12-mo warranty.

True Data is at 17092 Pullman St., Irvine, Calif. 92714.

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## Systems Auditor Says:

# Building Site One Security Factor for Users

By Howard A. Karten  
CW Staff

CHICAGO — A good physical security audit should cover four broad areas, according to C. Richard MacWilliams, manager of systems auditing for Union Mutual Life Insurance Co. of Augusta, Maine. The building that houses the computer, the computer room itself, disaster and contingency planning and other considerations including records, personnel and insurance should be studied carefully.

With respect to the building itself, there are three areas auditors should investigate: the location of the building, its construction and the security provisions. Factors to be considered include whether the location is urban or suburban, the likelihood of occurrence of certain natural phenomena such as hurricanes, tornadoes and earthquakes and the likelihood of flooding caused by broken dams.

Certain factors such as the height of the ground and the location of the computer room within the building can affect each other. For example, although many experts do not recommend placing the hardware in the basement, fearing the dangers of flooding and backed up sewage, these fears are mitigated somewhat if the building is located on high ground.

The proximity of the building to water or a fire department could have a significant impact on security, he indicated. Another consideration he recently added to his list is whether the building is located near a nuclear plant, MacWilliams told an audience at the Ninth Conference on Computer Audit, Control and Security.

### Thwarting Can Openers

Construction of the building is important, too, he said. For example, older buildings may have problems with the adequacy or safety of the wiring, drains or windows. As for the construction material itself, brick and concrete are best. A metal building can be opened "like a tin can," and the best advice for users housed in a wooden building is, "Forget it, move."

Building security also is important.

Being the sole occupant of a building means having fewer potential concerns than one would have if the building were shared with other businesses.

A building that is open to the public is obviously less secure than one to which access is controlled. Access can be limited to the buildings themselves, to the grounds or to parts or floors of the building. The alarm system is another consideration, he noted.

### Evaluation of Computer Room

Security, safety and the equipment (or facilities) are the three areas to consider in evaluating the computer room. Users should determine whether access is restricted to operations personnel,

whether doors are kept locked and whether lock combinations are changed periodically.

Doors should have hinges that are hidden or tamper-proof, and vendor representatives should always be escorted within the building.

Windows present a significant problem for computer rooms, MacWilliams observed. Windows to the outside of the building are vulnerable to a variety of threats, including guns, rocks and people. Internal windows also represent a potential source of security breaches.

One subtle soft spot in security precautions is the interior wall. In many buildings with dropped ceilings, the

walls extend only as far as the false ceiling, allowing intruders to go up and over into the room. Closed circuit cameras also can be used in computer rooms to improve security, he noted.

In their zeal to ensure security, DP auditors should not overlook safety, MacWilliams said. For example, the increase in physical density of computer equipment means the weight-bearing load of a floor should be considered when installing hardware.

In some cases, computer equipment being moved into position has literally "ended up on the floor below," he stated. Similarly, a 40-lb fire extinguisher will do no good if it is mounted in too high or too awkward a position.



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## Sportcases Carry Data Modules

HOPKINS, Minn. — Sportcase, Inc. recently introduced a line of carrying cases for data modules, disk packs, cartridges and cassettes. The cases are available either with custom-cut foam inserts or with foam that can be cut by the customer.

Sportcases are constructed of leather-grain plastic. The foam on the inside reportedly reduces the possibility of damage and firmly anchors the contents in place.

Strength and durability are achieved by riveting the lock, handle and hinge through the plastic and into the aluminum valance. Metal corners are optional for shipping protection.

With custom-cut foam, the unit costs \$110; with uncut foam the case costs approximately \$70 from Sportcase at 610 13th Ave. S., Hopkins, Minn. 55343.

## "Productivity is up 50%."



*Harry Wolford, Director of Computer Services and Statistical Reports, Ohio State Department of Education, Columbus, Ohio.*

### **Productivity.**

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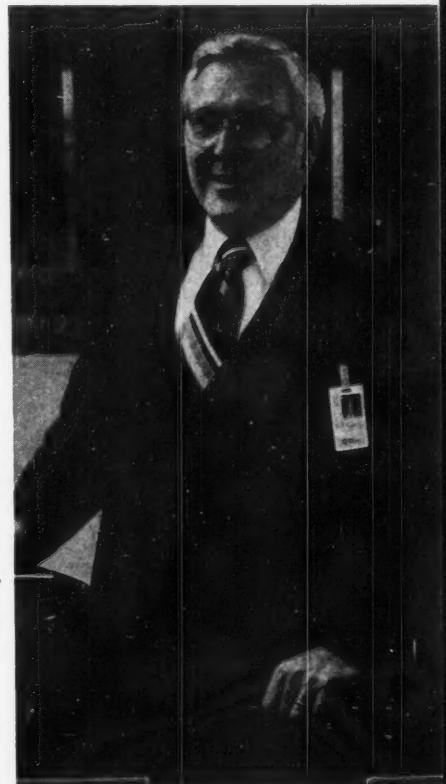
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"The conversion took less than an afternoon—with absolutely no software changes. We just told the machine it had more memory, and that was all there was to it."

*H. B. Taylor, Director, Houston Computer Center, Allied Chemical Corporation, Houston, Texas.*





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*Dr. Paul Whalen, President,  
Interactive Computing of  
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# 'Data Entry MIS' Designed to Ease Operation

(Continued from Page 51)

control module first, two of the forms were designed solely to collect raw data concerning that aspect of the operation. The remaining four forms (for example, batch ticket and report request) were designed to be used at the system level to control input, processing and output for any of the seven modules.

## Distributed Setup

A distributed data entry system was implemented to meet input requirements, and each department was given a user space on the Tymshare mainframe. Operators were guided by a Profile Exec feature in the operating system that prompts the data entry trainee throughout the entire terminal

session.

Operators may select data entry, on-line data base query or report request functions from a menu displayed on the CRT screen.

If the operator attempts to write alpha data to a numeric field, a bell rings to alert him and no write takes place. In addition, the operator cannot make field length errors because the cursor truncates the field at a specified length.

When a user function key is struck, the data is transferred to the host computer, and screen coordinates of the starting character position of the field are automatically prefixed. This feature is important later in the validation and update routines.

When the operator has completed the current session, another user function

key is hit and the operator is logged off.

When a data base update is scheduled, an Exec language program polls each user space and if data has been entered, it appends the file to a raw data master and erases the departmental user's data entry file.

This raw data master is processed by a conversion routine written in Focus nonprocedural language.

Based on the screen coordinates and form type, Focus will retrieve the data dictionary field name and a list of logical edits to be applied to the field. In this way, each data field entered into the system is tagged, validated and accounted for throughout the processing phases.

From this point on, a series of DBMS

programs, validate, audit and update the data base.

## Run Control Record

All processing software and data bases reside on a user space controlled by a user department that had pre-MIS administrative overhead functions. This user space operates like the data entry user spaces; the operator copies a paper form onto the CRT. In this case, however, there is only one form, the System Run Control Record (SRCR).

The various department MIS liaisons enter 'Y' or leave blank boxes on the SRCR that request data base update, purge, audit and so on. The liaison can also consult a report catalog and request up to 10 reports simply by entering the 7-character report identification in the spaces provided on the SRCR.

The paper SRCR goes to the data entry person in the administrative department and is entered via the 4025. The 4025 output from the SRCR is read by a DBMS program, edited and validated and a validation report is spooled to the local printer.

If the SRCR is invalid (for example, the report ID is nonexistent), it must be reentered. If the SRCR is valid, the DBMS will write to a disk file a series of CMS and DBMS commands necessary to accomplish the requested processing. This disk file is then invoked and executed in an overnight batch mode.

The system can accept up to 99 SRCRs in one overnight run. Output is stored on a system pool for local printing and distribution.

## Special Reports

Special, one-time and unforeseen reporting requirements are addressed with our Self-Programming Report Generator. The MIS liaison consults a data dictionary and enters field names, graphic or printed output selector, sort arguments, screens, title and other parameters on a paper form. The department data entry operator "form fills" on a 4025.

The raw requests are collected and an Exec program converts them to DBMS syntax. In the morning, the graphs and/or reports are printed and distributed.

How successful has this data entry MIS been? The first module has been operational for six months. After an initial "hand-holding" period immediately following implementation, we've settled into a one-man, part-time maintenance agreement with the client — and most of that is for enhancement activity.

This complex system is routinely run by enthusiastic clerical personnel in five to 10 minutes a day; data entry time is directly proportional to volume.

The other six modules have been authorized and are being developed.

In a broader view, it is apparent that the techniques discussed here must be developed and mastered in order to increase productivity in the face of the present and worsening shortage of qualified systems personnel.

Harmon is a senior programmer analyst for PRC's Data Services Co. and currently serves as deputy project manager for MIS development.

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\**Datamation* Reader Preference Studies, 1978, 1977, 1976, 1975

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## An Unusual Configuration

# OCR System Cuts School District's Costs 40%

SAN JOSE, Calif. — A near-unique configuration of hardware has helped a unified school district here cut its DP costs by nearly 40% in the past four years. The saving is particularly important in the wake of California's passage of Proposition 13 last year.

The hardware configuration consists of an IBM 1403-N1 printer, a Burroughs Corp. 4842 mainframe and a printer controller manufactured by Spur Products Corp. of Los Angeles. The three-vendor setup became necessary when the school district, in an effort to reduce costs, converted from a system using keypunch cards to one combining optical character recognition (OCR) and pencil-mark readers.

"When we converted, we told Burroughs, 'If you can provide us with a printer that will work with our OCR system, we'll accept it; otherwise, we'll go to another vendor.' Burroughs did not have a printer that would give us OCR-quality print at that time," according to Paul J. Fracoli, director of data systems for the San Jose Unified School District here.

As a result, Fracoli turned to Spur Products, which was the only company he could find that makes a controller that could perform the interfacing he wanted.

The IBM 1403 printer was essential to the system, Fracoli said, because it is the only one that had the print reso-

lution and registration characteristics necessary for the OCR-based system the district had installed. That system keeps track of virtually all the data used by the district including attendance counts, on the basis of which the district's financial aid allotments are calculated.

### Benefits Afforded

One of the benefits the system has afforded the school district is the ability to send students their grades a few days after receiving them from teachers. Formerly, compiling and posting grades for the approximately 100,000 classes took several weeks.

The district is turning increasingly to

computerized systems to cut costs in the wake of Proposition 13, Fracoli noted. To help speed data to those who need it and cut down on clerical costs, for example, the state placed CRTs in nine schools in the district.

Another task the district can perform less expensively is conducting the demographic surveys sometimes requested by state and federal agencies, often with short lead times.

If the information needed for these surveys is not contained in the student data base, a questionnaire is prepared with the help of the printer, routed to the target group and processed through the OCR hardware.

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If you're interested in more information on renting printers or terminals from Rental Electronics, call one of our local rental centers today.

They're listed opposite. Our on-line computers at every location let us give you price and availability information instantly, while

you're still on the phone. In the meantime, check some of our featured rental offers below.

### Printers and Data Terminals

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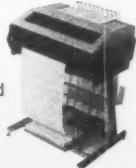
Printer operates at 150 cps on 9 x 7 wire matrix assembly printhead. Full ASCII Keyboard (ANSI-compatible) with N-key roll over. Operates in Asynchronous, USASCII, RS232C interfaces and is compatible with Bell 103, 113, 202 and 212 units. Selectable baud rates of 110 to 9600.



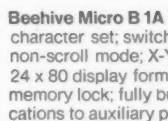
**Hewlett-Packard 2621A/P Terminals**  
Enhanced 9 x 15 dot character cell, full 128-character ASCII character set in 24 80-character lines. Two pages of continuously scrolling memory. RS232C and Bell 103A compatible. 110 to 9600 baud. 2621/P includes built-in printer operating at 120 cps.



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**ADDS Regent 200 Terminal** 24 lines x 80 characters, 25th "status" line shows operating mode. 128 character ASCII. RS232C/CCIT V.24 communications interface operating 75 to 19.2 BPS, switch selectable. Buffered transmission, auxiliary ports.



**Beehive Micro B 1A Terminal** 128 ASCII character set; switch selectable scroll/non-scroll mode; X-Y addressing; 24 x 80 display format; single key memory lock; fully buffered communications to auxiliary peripheral device.



**Lear Siegler ADM-3A Data Entry Display Terminal** 12" diagonal, 24-line screen. 64 ASCII characters. Full or half duplex operating modes, switch selectable, baud rates from 75 to 19,200. RS232C interface, 20mA current loop.

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C 5/14/79

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Always a step ahead in technology.

# NCR announces nine

One of the industry's best price/performance ratios, plus



Multi-bus design with multiple coupled instruction processors. 4 to 12 megabytes of memory and internal cycle speed of 56 nanoseconds. Monthly rental from \$21,139.



Uni-bus design with multiple coupled instruction processors. 2 to 6 megabytes of memory and internal cycle speed of 56 nanoseconds. Monthly rental from \$9,792.



Multi-bus design with multiple coupled instruction processors. 2 to 8 megabytes of memory and internal cycle speed of 56 nanoseconds. Monthly rental from \$13,323.



Uni-bus design with single instruction processor. 2 to 4 megabytes of memory and internal cycle speed of 56 nanoseconds. Monthly rental from \$5,884.



Multi-bus design with multiple coupled instruction processors. 2 to 6 megabytes of memory and internal cycle speed of 56 nanoseconds. Monthly rental from \$8,457.



Uni-bus design with single instruction processor. 1 to 3 megabytes of memory and internal cycle speed of 56 nanoseconds. Monthly rental from \$3,451.



Multi-bus design with multiple coupled instruction processors. 1 to 2 megabytes of memory and internal cycle speed of 84 nanoseconds. Monthly rental from \$6,281.



Uni-bus design with single instruction processor. 0.5 to 1 megabyte of memory and internal cycle speed of 84 nanoseconds. Monthly rental from \$2,363.



Uni-bus design with single instruction processor. 0.5 to 1 megabyte of memory and internal cycle speed of 112 nanoseconds. Monthly rental from \$1,330.

With the introduction of these nine new computers, NCR now provides the broadest line of high-performance, intermediate-to-large-range computers at dramatically lowered price levels. Monthly rentals start at only \$1,330.

If you are ready to step up from minicomputers, in need of more powerful transaction processing networks — or anywhere in between — then you're ready for the step-ahead technology of these new NCR systems.

#### **Multiprocessing Flexibility. New, Unique, Practical.**

With these new NCR systems you pay for the added capacity of multiprocessing only when you need it.

Four of the new systems (these are the M systems) can be upgraded to multiprocessing when required. Four others (the MP systems) are full-fledged multiprocessors when installed. These processors can be mixed in unique configurations to meet the most complex multiprocessing requirements.

- Now, for the first time, up to four processors can be tightly coupled to provide ultimate multiprocessing power and reliability. Coupled systems share all resources equally. But they can operate as independent processors at any time.

- For the first time, a mainframe supplier offers a family of systems that can be tightly coupled in a variety of configurations regardless of differences in internal speeds. Giving more options to the user.

- Now, for the first time, VRX-MP — NCR's newly introduced virtual operating software — uses parallel multi-tasking techniques, to provide high-level efficiency by adjusting automatically to peak-load demands.

#### **Bus Architecture. Improving an Improvement.**

Bus Architecture was recognized as a significant breakthrough in 1976 when it was incorporated by NCR into a full-scale computer for the first time. It was a major feature of the NCR 8550 and 8570. In 1978, for the first time, it was made part of large-scale computer systems. . . the NCR V-8650 and V-8670.

The advantages of Bus Architecture now have been proven by NCR systems in operation around the world. And the concept is advanced in these nine new NCR systems.

With Bus Architecture the computer system splits up the workload. The Internal Transfer Bus is an ultra-high-speed data path that channels information among as many as 12 processing elements without central monitoring. It provides high-level concurrent processing.

#### **High-speed Logic, High-speed Links. Another Step Ahead.**

These new systems feature emitter-coupled logic, the fastest commercially available circuitry. Operating at cycle speeds up to 56 nanoseconds, these systems are significantly faster than even the most recently announced competing systems. Still more for your money.

Central processor performance is complemented by bit-serial link input/output, handling high-speed peripherals with transfer rates up to 1.2 million bytes per second. This feature incorporates the latest error detection mechanisms, and allows peripheral attachment through coaxial cables.

# new computers.

## multiprocessing capacity.

### **New Software Support. Online.**

Early next year, NCR will begin a comprehensive online software support service. Subscribing customers will have online access to a complete operating software information data base. In addition, regional centers will be staffed by software experts to provide dialog when needed with VRX-MP and other advanced software customers.

### **Migration Path Engineering. Avoiding Obsolescence.**

NCR Migration Path Engineering is a unique concept in software compatibility built into each NCR 8000 Series system. Users get the easiest system-to-system transition in the industry. The climb is consistent and logical within each family.

That's why an NCR customer can easily move from one of these new systems to the next as his volume increases. Or from another V or N mode NCR system. The same software can be used. And nothing changes but the available power.

### **Small Size, Big Performance.**

Rapidly advancing technology has made it possible to shrink computer components and reduce overall size dramatically. V-8500M systems, for example, house all processing elements and up to 6 million bytes of memory in a cabinet that occupies less than ten square feet of floor space. Compact size, use of

conventional power sources, and less stringent environmental requirements simplify installation. If the operator is comfortable, the system is comfortable.

Through NCR technology, these new systems with high-speed circuitry, large memories and concurrent processing capability offer impressive throughput at new lower price levels.

The result is one of the best price/performance packages on the market today. So if you are ready for a new computer system you now have a logical choice. Nine choices. Whichever meets your price and performance needs.

Find out which of these new systems meets those needs best. Contact your local NCR office. Or write to EDP Systems, NCR Corporation, Box 606, Dayton, Ohio 45401.

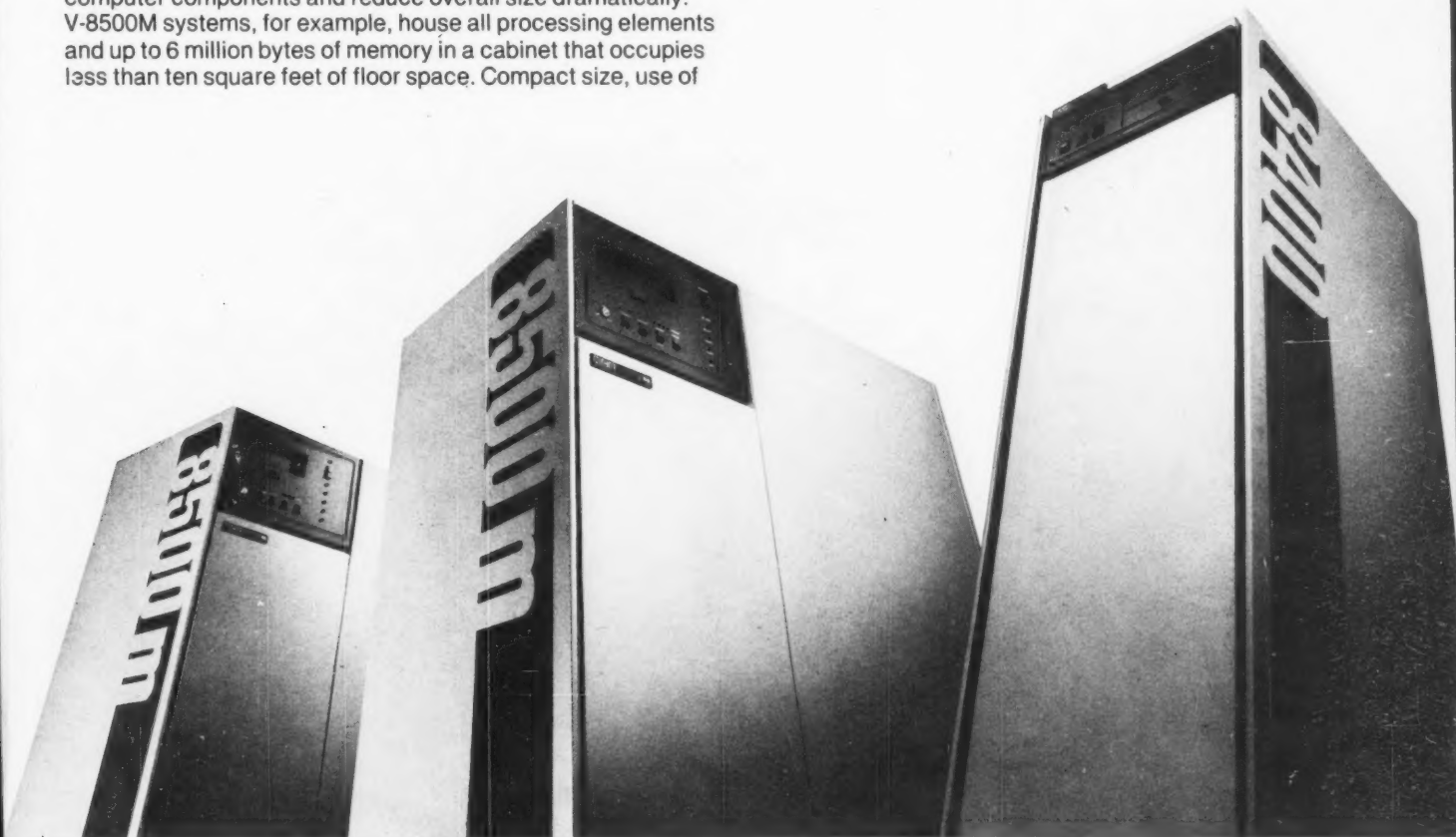
You'll be a step ahead, too.

**NCR**

Complete Computer Systems

**World's second largest computer company.\*  
Second to none in performance.**

\*International Data Corporation, 1978, based on revenue generated from computer operations.



Largest of the nine new low-cost, high performance systems is the V-8585MP multiprocessing system. Memory ranges up to 12 megabytes and internal cycle speed of 56 nanoseconds. Monthly rental starts at \$21,139.

The new V-8455, the smallest of the new systems, has a memory range up to 1 megabyte and internal cycle speed of 112 nanoseconds. Monthly rental from \$1,330.

# At last! An economy terminal with all the features you need to support a wide variety of business applications.

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- Operator/application-defined function keys.

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## Plus!

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- Non-glare display.

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When you've got superior products, you stand behind them. Hazeltine stands behind all its products. It is standing behind the Hazeltine 1400, Hazeltine 1410 and the new Hazeltine 1420 with a 2-year return-to-factory warranty on those terminals delivered in the United States after January 1, 1979.

## 3 Terminals to Choose From!

Yes! Now there are three terminals in this Series to choose from. With all the high quality and reliability you've learned to expect from every terminal bearing the famous Hazeltine name. Each so attractively priced you won't want to look any further.

# Now Hazeltine 1420!

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## Getting More For Less?

Has a minicomputer or small business system boosted your organization's productivity?

Experts say the key to licking our current economic woes is getting more from investments in capital and labor. Can you suggest ways that small systems — microcomputers through superminis — can serve that function, cost-effectively boosting the output of goods or services?

*Computerworld* invites you to answer any of those or related questions by contributing application experiences, opinions or advice to an upcoming special report, "Minicomputers and Small Business Systems." The report will appear at the end of August.

Articles should be sent by June 20 to Brad Schultz, CW, 797 Washington St., Newton, Mass. 02160. Manuscripts must be four or five typewritten (double-spaced) pages — accompanying artwork is welcome — and authors should include their job title, work address and telephone number.

## Business Unit, Disk Come on a Board

By a CW Staff Writer

SANTA CLARA, Calif. — A double-density microcomputer has been combined with a Winchester-type hard disk unit to form a single-board small business system that reportedly sells for roughly half the cost of competitive offerings.

The ACS 8000-6 from Altos Computer Systems, Inc. couples the firm's Zilog, Inc. Z80-based processor with a Shugart Associates Model 4004 hard disk unit.

The 4 MHz processor itself holds 32K to 208K bytes of random-access memory (RAM) and incorporates twin 8-in. floppy disk units that access in 30 to 50 msec and store 512K to 4M bytes. The companion hard disk system, meanwhile, accesses in 10 msec and stores up to 15M bytes on one 14-in. platter.

Altogether, this basic configuration (with a 32K-byte RAM) costs less than \$9,000, an Altos spokesman said.

Despite its single-board design, the ACS 8000-6 is said to support up to four simultaneous users and provide two RS-232 inter-

(Continued on Page 62)

## Guide Gives Details Of Desktop Systems

NORFOLK, Va. — A "Correlation Guide to Desktop Computer Selection" that identifies the hardware and software characteristics of more than a dozen popular desktop systems is available from Atlantic Analysis Corp.

The guide includes a general description of each vendor's offering and contrasts each product with its competitors. The systems include IBM's 5110, Wang Laboratories, Inc.'s 2200, Hewlett-Packard Co.'s 9800, Tektronix Corp.'s 4050, Apple Computer, Inc.'s Apple II and the Radio Shack TRS-80.

The guide features two matrices, one which allows the user to weigh hardware differences and one which allows the comparison of more than 200 Basic statements. Each matrix provides a space in each category to enter the characteristics of any system not described in the guide.

The \$14.95 guide also contains a glossary of hardware and software terms and matrix information, Atlantic Analysis said from Suite 219, 5 Koger Executive Center, Norfolk, Va. 23502.

# Desktop System Designed For Very Small Businesses

By Jeffry Beeler

CW West Coast Bureau

TORRANCE, Calif. — Hardware, training aids, documentation and application software are all reportedly combined in a desktop systems package that Randal Data Systems, Inc. is selling for less than \$12,000 to professionals and "very small" businesses.

Typical users of the Randal 5000 system will include manufacturers, wholesale distributors, auto parts dealers, doctors, dentists and certified public accountants whose annual revenues range from \$100,000 to \$1 million.

Although it sports a higher model number than any of Randal's other offerings, the 5000 represents a low-end addition to the company's small business systems line, which also includes the Link-100, 200 and 500.

In price/performance, the desktop unit falls roughly midway between an Apple Computer, Inc. or a Radio Shack personal computer on one hand and an IBM 5110 or a Qantel Corp. 210 on the other. In short, the 5000 fits in a product niche not currently occupied by any other system, a Randal official explained.

For end users, the desktop unit's chief ad-

vantage is its ability to offer a "total systems package," including applications, for less than \$12,000, the official said. Although many other vendors make similar claims, their prices almost always cover less than a complete system. IBM, for example, advertises its 5110 for less than \$18,000, but that figure excludes the cost of software.

Like most other competitive small business systems, a 5110 costs at least \$20,000 to \$25,000 for a full hardware/software package.

Qantel quotes its 210 small business system for \$12,000 to \$13,000, but the advertised price makes no allowances for either software or a printer.

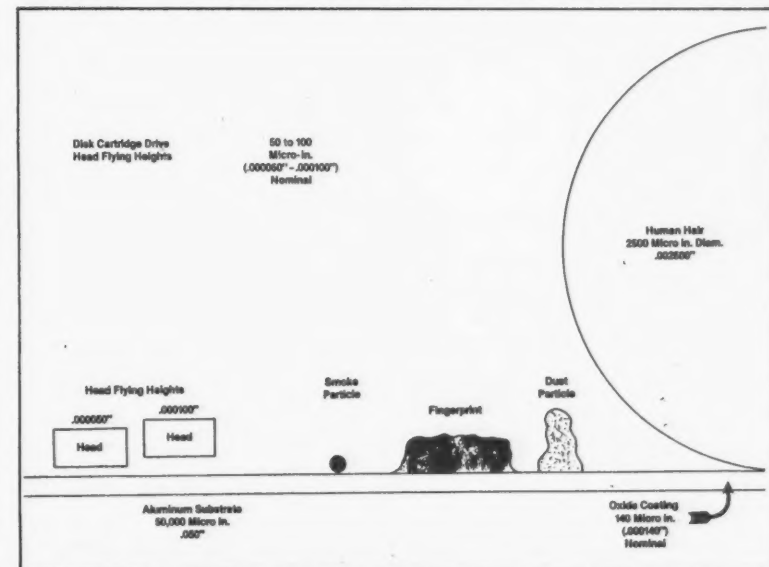
The price of a Randal 5000, by contrast, includes all the necessary systems modules including a processor, main memory, minifloppy disk unit, CRT terminal, keyboard, printer, operating system and a choice of four application packages.

How can Randal offer a complete system for less than \$12,000? The company spokesman credited the feat to reduced software prices.

Unlike most other small business systems vendors, Randal plans to provide no customized application packages for its System

(Continued on Page 62)

## With DP Now Getting Dirtier, Disk Cleaners Seen Invaluable



This diagram compares the sizes of smoke particles, fingerprint oil, dust and a human hair with the height at which read/write heads "fly" above the oxide coating of a disk cartridge.

### Special to CW

With distributed data processing (DDP), small business computing and the use of computers for machine control, the computer revolution has entered a new phase. No longer is all DP done in sealed, air-conditioned, air-filtered, humidity-controlled, sanitized computer rooms away from the smoke and dust of the workaday world.

Today computers are found in offices, warehouses, workshops, plants and garages. And while small business and DDP help speed the flow of information and machine control makes the computer available for more applications, these expanding functions also create problems.

A number of disk cartridge cleaning products for the small systems user have appeared in recent months. This article by the 3M Co. explains the need for such protection of magnetic media. Some 3M products are described as examples of what is now available — or may soon be available — from a number of vendors meeting this need.

High-speed, sophisticated electronic equipment needs to be kept very clean to

(Continued on Page 66)

MINI-TWO-RIED

# Desktop System Designed for Small Businesses

(Continued from Page 61)

5000 users. Instead, it will offer only canned application software and require its System 5000 customers to "change their businesses to fit the package rather than vice versa," the official explained.

In this way, Randal will spare its desktop system users the heavy expense of going to an outside service firm to have application packages personalized.

The application packages currently offered with the 5000 include modules for accounts receivable, accounts payable, general ledger and payroll. At present, Randal provides these packages only for businesses like manufacturing and wholesale distribution.

By next October, however, the four application software modules will also become available for users in the professions, the spokesman predicted.

Complementing the 5000's applica-

tion programs are a package of documentation and training aids that allow first-time users to install, operate and maintain their software without outside assistance, Randal said. Instructional materials include audio cassettes, diskettes and assorted reference manuals.

In addition to the application software and support, a basic 5000 system incorporates a 64K-byte processor, a CRT terminal with keyboard, two 200K-byte minifloppy disk units and a 60 char./sec printer. All the hardware modules except the printer are integrated in the system's enclosure.

## Limited Expansion

Because the desktop unit is self-contained, its expansion capabilities

are limited. Users can increase the 16-bit processor's main memory in 32K-byte increments to 128K bytes, and they can replace the 60 char./sec printer with a 180 char./sec model.

Otherwise, the 5000's hardware configuration is fixed. For this reason, users cannot upgrade the 5000 to larger members of the Randal small business systems line, even though the desktop unit uses basically the same operating system as its sister systems.

A basic 64K-byte 5000 configuration with a 60 char./sec printer, Version 5 of the Randal Time-Sharing Operating System and one application package sells for \$11,960. Each additional application package costs an extra \$400, compared with \$2,000 for each 32K-byte increment of MOS main memory.

The system can be leased for \$275/mo under a five-year contract.

Shipments of the system will begin this July from Randal at 365 Maple Ave., Torrance, Calif. 90503.

## Floppy Power Offered

LONDONDERRY, N.H. — CEI Corp.'s Model FD302 dual floppy power supply provides regulated outputs of +5 Vdc at 3A, -5 Vdc at .5A and +24 Vdc at 3A.

The OEM product offers a motor start rating of 3.4 and operates on 115 Vac to 230 Vac power at 47 to 63 Hz.

The open frame power supply is made of aluminum and costs \$84, CEI said from P.O. Box 501, Grenier Industrial Park, Londonderry, N.H. 03053.

## Business Micro Includes Disk

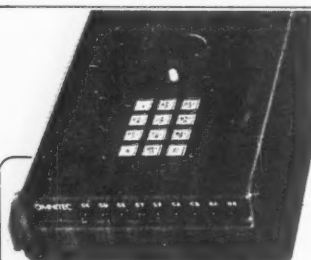
(Continued from Page 61)

faces for printer or communications. With a full complement of 208K bytes of RAM, the rack-mountable system allots 48K bytes to each user and 16K bytes for the operating system, which accommodates Basic, Fortran, Cobol and Pascal, the spokesman said.

Optional features include a multiuser operating system compatible with Digital Research, Inc.'s CP/M software and three extra I/O ports with three extra 32K-byte RAMs.

A basic 32K-byte configuration costs \$8,990. The multiuser operating system sells for an additional \$250, while the three extra I/O ports with three extra 32K-byte RAMs cost another \$1,990.

The ACS 8000-6 is available immediately from Altos at 2338A Walsh Ave., Santa Clara, Calif. 95050.



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# SMALL SYSTEMS POWER

## 1980s Outlook for Small Mainframes

■ TECHNOLOGY ■ APPLICATIONS  
■ ECONOMICS ■ COMMUNICATIONS

Small systems are no longer "mini" or "micro" in the power of usable memory, processor capability and versatility! This development has been obvious to industry observers for several years with the advent of the so-called superminicomputer, but now that IBM has put large system power in a small ("E" Series) mainframe in terms of size, cost per transaction, and total price, it's clear to the entire computer-using industry worldwide that small systems have arrived as a major force for almost every end user in the EDP environment!

Small systems haven't replaced big systems, they've amplified their power through communication networks and a hierarchy of new applications. This leverage has just begun, according to the panelists who will be assembled for

SMALL SYSTEMS POWER to be held at the Boston Museum of Science, May 22 & 23. The full range of small systems from board oriented through E Series will be discussed by leading consultants, vendors, users and university authorities. SMALL SYSTEMS POWER in the 1980s will provide new insight as to the economics, risks and payoff of future small systems applications and technology.

SMALL SYSTEMS POWER in the 1980's will address key issues such as:

■ Accelerating price performance trends in small systems, as users get closer to the processing power provided by advanced semiconductor technology. Which vendors will give the best package?

- Big mainframe software tools such as data base management systems will "fit" into small systems. How will this impact the use of large mainframes?
- Re-decentralization of data processing and files may occur as branch offices and plants again reinstall their own system instead of terminals. How will central management control this data base proliferation?
- All mainframes in a network environment boost demands for economical, high speed, broad bandwidth data communications. How will the carriers meet this challenge?
- Plug compatible mainframes will cover the full range of the IBM product line. How will users sort out the vendors? What role will service organizations selling small mainframes play?

## Register now for an event that will change your perspective on the role of small mainframes in central and distributed processing!

IITI, with Advanced Computer Techniques, Inc., co-sponsored the highly regarded FUTURE SYSTEMS FORUM earlier this year (See Computerworld, Feb. 19, 1979, pages 22-31), and managed the timely "Communication Networks" conference in Washington in February. IITI's management has conducted over seven dozen professional seminars and conferences in the past two years, including the definitive "Distributed Data Processing" series for International Data Corporation. More detailed information on IITI activities may be had on request.

Return the Advance Registration Form, or call this special number, 617-964-4352, for reservation. Cost for the program, including two lunches, cocktails, speaker materials and pre-conference survey is \$500. Hotel accommodations are not included, but may be reserved at nearby Boston Hotels. Please note that check or purchase order must be received by May 10 to confirm participation, and cancellations may be made at no charge in writing or Telex by May 15. Reservations may be transferred; a service fee of \$150 is charged late cancellations. Non attendance forfeits the entire registration fee.



International Information Technology Institute  
60 Austin Street, P.O. Box 265  
Newtonville, MA 02160

### Advanced Registration Form

Please reserve \_\_\_\_\_ space(s) @ \$500 per attendee at IITI's two-day SMALL SYSTEMS POWER. I am including the names of all those (beside myself) who will attend on a separate piece of paper. I understand that the fee includes program materials and reproductions of speakers' visual aids, lunches, refreshments, cocktails - but not hotel accommodations. I further understand that cancellations must be made by May 15 or be subject to a \$150 charge.

### Host Organization



The International Information Technology Institute, the program manager, is a non-profit organization chartered to provide professional development and educational support to information systems executives. It draws on the skills and experience of highly qualified consultants, users, vendors, and university researchers to address key issues in information systems planning, applications, computing economics and technology assessment. IITI programs emphasize practical presentations by skilled speakers, as well as audience involvement in pre-conference studies and issue definition.

## Boston Museum of Science

Morse Auditorium  
Boston, Massachusetts

**MAY 22, 23**



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Just fill in above, detach this form and mail to the address above. You will receive registration and accommodations information well in advance of the SMALL SYSTEMS POWER program.

## Increases Cash Flow

# Automation Fuels Chemical Firm's Order Entry

By Marguerite Zientara

CW Staff

BREA, Calif. — Increased volume, improved customer service and a better cash flow have resulted from a chemical supplier's move to a computerized distributed order entry system from a completely manual one.

The Union Chemicals Division of Union Oil Co., with an annual order volume projected at 65,000, produces such things as anhydrous ammonia, urea, ammonium nitrate, nitric and sulphuric acid, carbon dioxide, and sulphur, all of which come from natural gas or are by-products of petroleum refining.

With several plants on the West

Coast, the firm formerly had four order desks located at Brea and Fresno, Calif., Hedges, Wash., and Chicago, Ill. At that time, customer orders were taken over the telephone at the four locations and then entered on manual order forms.

These orders were either sent by TWX or telephoned to shipping facilities, where a bill of lading would be typed for each order. And once a shipment was made, a detailed shipping report was mailed to the accounts receivable department of Union Chemicals in Los Angeles for preparation of the invoice.

The entire procedure caused delays between shipment and invoicing of up

to a week, according to Roger Swanson, manager of supply for the chemicals Division Nitrogen Group.

In addition to overcoming the delays inherent in a manual system, the firm had to consider the seasonal nature of the demand for its products. Agricultural chemical demand, besides being seasonal, is usually high for short periods of time — sometimes as little as two weeks for a particular area and product. That means a very large volume of orders must be processed and shipped quickly.

Products are loaded into railway tank cars, tank trucks or railway and truck hoppers from several "load points" in each terminal. Load points, too, must

be carefully scheduled during peak demand periods.

### Studying Dilemma

An advisability team was formed to study the problem and recommend a better system. Its research concluded that the best move would be to centralize all the order desks in Brea, Calif.

Once the advisability team had developed the preliminary system specifications, it decided to have an outside contractor design the order entry system.

After considering a number of outside vendors, the chemical supplier selected Data Systems for Industry (DS/I) from Long Beach, Calif. to do the job "because they had the expertise we needed, and most companies didn't," Swanson noted. DS/I specializes in complete hardware/software turnkey systems for order entry, material requirements planning, inventory control and related business and manufacturing applications.

Beyond the prime objective of improving service, system objectives included automatic preparation of bills of lading, plant loading schedules, shipping reports and daily and weekly shipment summaries.

Other objectives included automatic validation of customer credit, product allocations, product sourcing (least-cost/origin-destination combinations), shipping point scheduling and freight term determination — prepaid, collect or credit.

In addition, the firm wanted a unit of measure conversion — from ordered unit to loading and pricing units — and transportation mode determination.

Finally, Union Chemicals felt it needed to generate reports for central invoice preparation automatically.

### The 'Core' of the Problem

To meet the company's needs, DS/I designed the Chemical Order Entry System (Cores), consisting of a central order facility in Brea with eight Hazeltine Corp. Modular I data entry terminals hard-wired to a Hewlett-Packard Co. Model 1000 minicomputer.

In addition, five HP 2645A intelligent terminals are "dialed up" by the HP 1000. These are located in each of five distribution sites. The terminals are equipped with cassette tape data storage and drive a local line printer to generate the shipping forms and documents.

(Continued on Page 64)

### SMALL SYSTEMS POWER

SMALL SYSTEMS POWER IN THE 1980's

## Hear these "leading edge" user/vendor/consultant viewpoints on SMALL SYSTEMS POWER!



**Dr. Jared A. Anderson**  
President, Two Pi Corporation

**Uses of IBM Compatible Minicomputers in DDP.**

**What's the role of IBM-like products in mixed vendor networks? How may networks evolve given new price/high performance elements?**

Co-founder of Two Pi, Anderson was previously Vice President of Research and Development at Computer Machinery Corp., president of a minicomputer tape and disk drive controller company and a Senior Scientist at University of California and Lawrence Radiation Laboratory.



**Alan Baumgartner**  
Director of Strategic Planning, National Semiconductor Corp., Systems Group

**Impact of Semiconductor Technology in the Computer Room**

**Dramatic cost reductions are here in small mainframes. What's ahead in new price/performance improvements as S/C technology enters storage peripherals, controllers, etc.**

Baumgartner "rationalizes" semiconductor technology with market demands. Earlier, he created leading edge systems for the Department of the Army, Westinghouse, and Pacific Telephone. He's drafted a universal user language that can be implemented on any computer for AT & T's Advanced Communication System.



**Dr. David Crockett**  
Program Manager, Advanced Computer Systems  
Hewlett-Packard Corporation

**Impact of Silicon-on-Sapphire on Small Mainframe Performance**

**How can systems builders use innovative technology to make small mainframes more "friendly" to ordinary users without specialized EDP training?**

Crockett had been Engineering Manager, Advanced Computer Systems, including system definition and initial development of the CMOS/SOS LSI technology, for the HP300. Earlier he was Product Manager for the HP3000, one of the first superminis, with responsibility for developing, manufacturing, marketing.



**Dr. Dixon Doll**  
President, DMW Associates

**Communications and Data Based Opportunities for Small Mainframes**

**Megamini and communications oriented "E Series" products are causing users to redraft network plans. What are the real opportunities for small mainframes in central, hybrid or distributed DP?**

Doll is recognized as one of the world's leading authorities in advanced communications networking architecture including SNA and DECNET. Dr. Doll and the DMW Group have executed many major network projects for Fortune 500 companies. In addition, he is Adjunct Staff Member of the IBM Systems Research Institute in New York.



**Robert A. Fertig**  
Vice President & Director  
Technology Analysis Group, Advanced Computer Techniques  
**E-Series Technological and Market Impact**

**Aggressive "E-Series" price/performance, as Fertig predicted, sent shock waves through the mainframe ranks. What can we see ahead for E-Series and its competitors?**

Fertig monitors industry technology and user trends for ACT clients and publishes special reports such as the recent "IBM Systems in the '80's, A Forecast of IBM's Products, Plans and Strategies", and a monthly newsletter, "Industry Measures". He draws on eighteen years experience in EDP, including ten with Sperry Univac's strategic and market planning group.



**Richard French**  
Minicomputer Software Product Manager, Cincom Systems, Inc.  
**Impact of Small Systems Architecture on Data Base Management**

**How will small mainframe's growing data base capability fit into the information storage hierarchy? Is small better in terms of complexity, updating?**

During the past 5 years, French has had a variety of responsibilities with Cincom, one of the leading vendors of data base management systems for small computers, in advanced research, technical support, and product development. He was Product Manager and Architect of the TOTAL data base management system for the DEC-PDP/11 minicomputer line.



**Patrick J. McGovern**  
Chairman, International Data Group, Inc.

**User Expectations in Small Systems Technology**

**Has the pace of mainframe innovation stepped up in the user's perception? What specific timetable do they see for new technical breakthroughs and product market debut?**

Now chief executive of International Data Group, McGovern draws on fifteen years of experience in evaluating the potential applications of computer technology. He founded "Computerworld", "Computer Business News", and IDG's German, Japanese and Australian weekly computer newspapers, as well as the IDC's research activities and Conference Company's Computer Caravan.



**C. Oakley Mertz**  
Vice President-Research, International Data Corporation

**Market Structure and User Migration Dynamics in the Small/Mid Mainframe Range Area**

**What are the dimensions of the current small/mid size mainframe market? Are new growth opportunities brightest for current EDP users or new, entry level customers?**

Mertz is responsible for IDC's industry-oriented Corporate Planning Service, and the Information Systems Planning Service for users, and other subscription services and consulting offered by IDC. He joined IDC in 1970, when the Corporate Planning Service was founded; this program now includes virtually every computer industry participant as a client.



**Jack Moran**  
Systems and Data Processing Manager  
Butler Manufacturing Co.

**Small Systems Planning for Medium Size Companies**

**What will E-Series mean to mid-size user's mainframe plans? How can they mix mini, small business or distributed systems to gain large mainframe power and throughput?**

Moran has headed Butler's systems development efforts for the past ten years, and had EDP management positions with Cummins Engine and Collins Radio. Butler has grown to be a \$400 million maker of prefabricated steel buildings; its data network included nodes for its own plants and outside distributor offices as well.



**Dr. John F. Rockart**  
Director, Center for Information Systems Research, MIT Sloan School

**The Applications Backlog for Systems "Friendly" to Users**

**EDP professionals set the pace for systems development in most companies. But do end users want what's given? An MIT study reveals application needs ideal for small systems.**

Rockart has been with MIT's Sloan School since 1966, and heads CISR's research improving the effectiveness and usability of information processing tools. His teaching has focused on the areas of management planning and control systems, and he co-authored the book, "Computers and the Learning Process". He also spent four years with IBM.



**Michael C. Sentt**  
Marketing Director, Nanodata

**Microcode and Its Associated Benefits/Applications**

**Microcode had dramatically improved systems throughput. What else can users expect from mainframe and peripheral suppliers? Can the user employ microcode himself?**

Prior to joining Nanodata, Mr. Sentt was National Sales Manager for IRT, an international communication carrier and had sales management responsibility to national accounts for Sperry-Univac. He is the author of the three-part series "Microcode Fundamentals" published in "Computerworld".



**David Smith**  
Consultant, Communications and Computer Sciences Dept., Exxon Corp.

**Impact of Small Systems on Long Range EDP Planning**

**How will large users employ small systems? What are cost, service/support and purchase tradeoffs versus large systems? How can users plan for technological change?**

Smith is responsible for technological forecasting and the coordination of evaluation, development, and assimilation programs for new hardware, software and methodology for Exxon. Smith joined Exxon in 1967 from Orchard-Hays & Co. He has served as President of SHARE, Chairman of the ANSI SPARC Data Base Study Group, and is a co-author of "Data Processing in 1980-1985."

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# Controller Ties Century Processor, Peripherals

DALLAS — Century Computer Corp. has announced a general-purpose controller that reportedly bridges the gap between its Century 400 processor and high-speed peripherals.

The Programmable Peripheral Interface (PPI) can connect four disks, four magnetic tape units and four cartridge disks to the Century 400, according to a spokesman. Primarily designed for the high data stor-

age market, the PPI presents a standard block-oriented channel structure to the operational software, he noted.

All transfers are made between the PPI and the computer via direct memory access. The devices are controlled by standardized command blocks that use similar commands and have standard status responses.

The microprogrammed control unit has 16-bit word

length, 48-bit microprogram control word length, 220 nsec instruction execution time and 38 instructions including arithmetic, logicals, shifts, rotates and literals, the spokesman explained.

## Bit Registers

The unit has 16 general-purpose bit registers and 16 external 16-bit registers for peripheral device input. It has 12K of 48-bit words in a micropro-

grammable read-only memory (ROM) space expandable to 65K words and 512K of 16-bit words in random-access memory (RAM) on board, with RAM accessibility to 65K.

The local RAM is used primarily for buffering blocks to and from peripheral devices, for error checking and for retrying, the spokesman said.

In disk-to-disk or disk-to-tape operations, the PPI can search for disk file by key,

write and verify sector.

The PPI costs less than \$4,000; with a 74M-byte disk it costs less than \$10,000. Century Computer is at 4410 Spring Valley Road, Dallas, Texas 75240 or 2339 Stanwell Circle, Concord, Calif. 94520.

## System Fuels Order Entry

(Continued from Page 63)

The HP 1000 system includes a 64K-byte memory, two 15M-byte disk drives, a 300 line/min printer and a magnetic tape drive for transaction logging and system backup. The computer communicates with an IBM Model 3033 mainframe with 8M bytes of memory, using an IBM 2780 emulator and a bi-synchronous line protocol.

After sales personnel take an order over Wats lines in Brea and fill out an order form, the order is entered at a data entry terminal.

Several times a day, the HP system dials up the HP 2645A terminals at the distribution points. It first collects shipping confirmations stored on cassette tape in the terminals and then transmits new orders, bills of lading and schedules, which are stored on a second tape cartridge in the terminals. The terminals control local line printers that generate hard copy for each order.

Shipping confirmations are then processed by the small computer and transmitted as a remote job entry to the Union Oil Co.'s IBM 370, which prepares the customer invoice.

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Al Netten, Vice President,  
Peripheral Systems Group

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## Desktop Unit Has 630K Disk

CHATSWORTH, Calif. — A desktop computer featuring dual floppy disk storage capacity in excess of 630K bytes has been introduced by Problem Solver Systems, Inc.

The Exec I includes a 32K-byte random-access memory (RAM) and RS-232C-compatible ports to accommodate the user's terminal and printer. A system monitor automates the start-up procedure, ensuring ease of use for business or first-time users, a spokesman claimed.

The disk operating system and Disk Extended Basic software systems reportedly accept commercially available or user-developed applications packages.

Aimed at the small business and system house market, the Exec I is supported with specialized software packages including CP/M, Fortran and Cobol.

The Exec I costs \$3,695 with OEM discounts available. Problem Solver Systems is at 20834 Lassen St., Chatsworth, Calif. 91311.

## Logic Module Fits Perkin-Elmer

ORANGE, Calif. — A universal logic module (ULM) on a half-board that provides an interface between any Perkin-Elmer Corp. CPU and a peripheral device is available from MDB Systems, Inc.

The ULM features switch-selectable, 10-bit device addressing and 16-bit input and output registers, MDB stated. Forty-two 14- or 16-pin integrated circuit (IC) positions are offered for user-designed logic; larger ICs can be accommodated on .3-, .4-, .5- or .6-in. centers.

The bus side of the module provides device addressing, handshake, status and interrupt control to the Interdata Corp. multiplexer or selector channel bus, MDB continued. (Perkin-Elmer acquired Interdata in 1977.)

An optional provision for 40- to 50-pin ribbon cable connectors are on the front edge of the board, MDB said. The ULM costs \$495 with pins or \$550 with mounted pins and sockets.

MDB is at 1995 N. Batavia St., Orange, Calif. 92665.

## North Star Builds Disk Drive Cabinet

BERKELEY, Calif. — North Star Computers, Inc., has announced a cabinet for housing disk drives with the vendor's Horizon small system series.

The Additional Drive Cabinet (ADC) accepts either one or two industry-standard 5.25-in. North Star floppy disk drives. Like the Horizon, the ADC is available in either wood or blue metal.

The cabinet includes a power supply to support one or two drives and will house North Star's quad-capacity drives.

In kit form, the ADC costs \$129. Assembled, with one double-density drive, the ADC costs \$579 or, with two drives, \$999. North Star is at 2465 Fourth St., Berkeley, Calif. 94710.

## Unveiled With Other Devices

# Paper Tape Drive Controller Fits PDP-11

CUMBERLAND, R.I. — A paper tape drive controller for Digital Equipment Corp. PDP-11 minicomputers and other paper tape appliances are available from the Digitronics Division of Comtec Information Systems, Inc.

The Model 9603 controller reportedly plugs into the Unibus of any PDP-11 unit from the PDP-11/04 up and permits a user to operate any Digitronics reader, punch or combination unit with DEC paper tape software.

The controller was introduced for those users that require paper tape equipment with their DEC systems but do not desire or cannot afford the equipment DEC offers, Digitronics said. A typical user would be a firm that needs to punch and read mylar tapes or requires reader handlers not supplied by DEC.

Digitronics said the Model 9603 makes its entire line of paper tape equipment both hardware- and software plug-compatible with DEC paper tape devices. The controller is a standard DEC-sized card that plugs into a Unibus quad slot.

The controller can be set for any bus address the user desires, but is normally supplied with the address DEC employs for its reader punch combination unit, Digitronics noted. The one card will support either a reader, a punch or both devices.

### Reader/Punch Bows

A user may duplicate mylar or paper tapes without being linked to a processor with the Digitronics paper tape reader/punch combination, the desktop Model RP7100/A.

The RP7100/A allows the time-consuming process of tape duplication to be performed while the system processor is involved with normal work, the vendor said. The device combines Digitronics' 300 char./sec Model 2100 bidirectional photoelectric stepper motor reader with its 75 char./sec Model 1075 punch.

The reader has a single moving part and reportedly reads paper or mylar tapes with 5- through 8-level data. The punch section of the unit offers positive punching and retraction of punch pins and mechanical advance through a cam drive mechanism.

The RP7100/A is available for reel or fanfold tape and can be purchased with either an 8-bit parallel or RS-232C communications interface. Duplication options may be ordered with either interface.

### Portable Reader

Joining Digitronics family of paper tape readers is the desktop Model RB2100. The portable reader was reportedly designed to meet mounting user demand for occasional readings of paper tape without a need for expensive permanent cabinet space.

The self-contained RB2100 is a photoelectric device that uses a stepper motor driven sprocket to move tape in either direction at up to 300 char./sec. Digitronics called the reader ideal for personnel who would otherwise be required to carry several disk packs, floppy disks, magnetic tapes and paper tapes.

The Model 9603 controller costs \$575 or, with reader/punch, \$915. The RP7100/A desktop reader/punch starts at \$2,345 for a reel-fed unit; the RS-232C interface and duplicate option cost another \$500 and \$100, respectively. With quantity discounts available, the RB2100 desktop reader goes for \$695.

Comtec's Digitronics Division is located at 53 John St., Cumberland, R.I. 02864.

## Percom Offers Enclosures, Disk Drive Power Supply

GARLAND, Texas — Percom Data Co. has begun offering its minidisk drive power supply and disk drive enclosures as individual products aimed at most small computer systems.

Previously, those products were available only as part of Percom's LFD and TFD series of storage subsystems. The PS-401 power supply now comes complete and ready to use with power cord and plug, dc connector, fuse and on/off switch, the vendor said.

Percom's predrilled metal enclosures for one-, two- and three-unit minidisk drives are available in blue, silver or brown enamel finish. Other enclosure colors are optional.

The PS-401 dual +5V and +12V outputs are rated to meet the input power requirements of most minidisk drives, Percom maintained. Those drives include Shugart Associates, Inc.'s SA-400 and 450 models; Pertec

Computer Corp.'s FD-200 and 250 models; Wangco, Inc.'s (now part of Perkin-Elmer Corp.) models 82 and 282; Micropolis Corp.'s 1015/I and 1015/II units; and MPI Sensory Testing, Inc.'s Model B51.

Input requirements for the PS-401's domestic version are 117V ac at 50 to 60Hz and .5A, maximum. The foreign version operates on 230V ac at 50 to 60 Hz and .25A, maximum, Percom said.

The PS-401 also features thermal overload protection and short-circuit current limiting. The operating ambient temperature range is 0°C through 40°C, while the storage range is reportedly -22°C through +50°C.

In 100-unit quantities, the PS-401 costs \$32.50. The 100-quantity price of the one-drive enclosure in a standard color is \$14.17 each.

Percom is located at 211 N. Kirby, Garland, Texas 75042.

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## Micro Handles Floppies

PALO ALTO, Calif. — A micro-computer system with a disk controller that offers up to 512K bytes of floppy disk storage is available from Dynabyte, Inc.

The system combines Dynabyte's DB8/1 CPU box with the DB8/4 floppy unit, which features two Shugart Associates, Inc., single-sided drives or 2M bytes on two double-sided drives.

The system's disk controller handles a variety of 5-in. and 8-in. dual-density drives on either one or two sides, Dynabyte claimed. To permit expansion of the system as the user's needs increase, the controller reportedly handles a total of 16 drives.

Dynabyte's Dynamic Data Com-

pensation feature yields a double-density error rate comparable to single-density rates, a spokesman said. The combination of the DB8/1 and the DB8/4 offers the user 32K bytes of static random-access memory, expandable to 176K bytes; two serial and one parallel I/O ports; 4 MHz Z80 microprocessors; the dual-density disk controller; and two floppy drives.

Software available from Dynabyte includes Basic, Fortran, Cobol, word processing, general ledger, accounts payable, accounts receivable and various CP/M modules.

The DB8/1 processor box costs \$2,295 and the disk unit costs \$3,130. Dynabyte is at 1005 Elwell Court, Palo Alto, Calif. 94303.

## Disk Cleaners Invaluable With DP Getting Dirtier

(Continued from Page 61)

operate with maximum efficiency and reliability. Yet optimum levels of cleanliness are hard to achieve outside the sanitized computer room.

Cleanliness is as important for magnetic media as it is for hardware — not because the cost of the medium itself is so critical, but because the data recorded on the media can, in some cases, be invaluable.

This has fostered a concern about cleanliness in such applications, particularly with regard to magnetic disk cartridges, one of the leading storage media for minicomputers. In these components, microscopic contaminants can cause data loss because the

read/write head on a disk drive does not actually contact the medium's magnetic surface.

Instead, the head flies on a cushion of air only 50 to 100 microinches from the surface of the disk at a speed of up to 3,600 rev/min (nearly 140 mph). A tiny speck of dust or dirt, a human hair, a particle of cigarette smoke, even a fingerprint, are all thicker than that critical air cushion.

### Harmful Results

These contaminants can cause one of two things:

- The head will fly over the obstruction, overshooting the normal position, and miss data.
- Larger particles can sandwich between the head and the disk, causing a "head crash" that can actually gouge the oxide coating away, destroying recorded information.

Where do these contaminants come from? They're part of any non-sanitized environment. And while one may think that a factory floor is an obvious example of an unclean area, even an office environment is many times dirtier than the traditional computer room.

Disk cartridges left in open areas can easily be affected by dust and dirt. Careless handling leads to fingerprints on the magnetic media. The head access door on front-loading cartridges becomes worn out and may fail to close properly, losing a dust-tight seal.

Once contaminants enter the scene, data errors, headcrashes, lost data and lost time, frustration and increased DP costs are the result.

### Cleaners to the Rescue

The 3M Co.'s Data Recording Products Division has introduced two disk cartridge cleaners for magnetic media maintenance to remedy this problem [CW, April 30].

The Model 9100 disk cartridge cleaner for front-loading disk cartridges and the Model 9200 for top-loading cartridges allow proper, safe and thorough cleaning of a cartridge's magnetic recording surfaces in about three minutes. According to 3M, the cleaner is efficient, easy to operate and will meet the needs of any cartridge user.

The 3M disk cartridge cleaner uses CS-50 cleaning solution, a 3M formulation, which is nonflammable and dries quickly, leaving no residue. Cleaning pads, also available from 3M, are placed on the cleaning arms of the unit for each cleaning cycle.

After the cartridge is inserted into the cleaner, the operator pushes the "process" button. The disk cleaner removes dirt, dust, oil, smoke particles, paper bits and oxide redeposits and leaves no residue, according to 3M. When the process is completed, the unit shuts off automatically.

Periodic cleaning — the frequency of which may be determined by the level of use as well as environmental conditions — constitutes a practical maintenance program for the protection of valuable data, 3M said.

More information can be obtained by writing to Department DR8-20, the 3M Co. at P.O. Box 33600, 3M Center, St. Paul, Minn. 55133.

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## Analyzes Consumer Behavior Market Researcher Boosts Service Via Minis

FLORAL PARK, N.Y. — A 15% to 20% annual reduction in DP costs and a "dramatic improvement" in turnaround time and service have accrued to a market research firm here that went from a service bureau to in-house minicomputers for gathering and analyzing statistics.

NPD Research, which claims to be the largest U.S. firm specializing in collecting, processing and analyzing consumer purchasing behavior, uses monthly diary panels to accumulate its information. These

diaries — each consisting of 20 pages of detailed buying information — are filled out and submitted to NPD each month by about 50,000 American families.

The diary panels cover about 60 categories of frequently purchased consumer items including foods, paper goods, health and beauty aids, toys and textiles. Each category is then broken down into specific types of goods.

For example, within the paper goods classification are questions pertaining to paper

napkins, facial tissues, paper towels and toilet tissue. For each purchase, the family records the brand name, type of product, package size and weight, purchase price, place of purchase, type of store and which family members will use for them.

### Service Bureau Expenses

With so much data to analyze, the company was paying a lot for computer time with the service bureau because the bureau used a "special marketing research language," according to Lanny Catz, NPD's vice-president of computer operations.

Furthermore, Catz said, "we wanted better control over our data processing and faster turnaround, so we decided to bring everything in-house."

NPD decided that purchasing a number of minicomputers would offer more economy, backup and flexibility than the acquisition of a large mainframe. In 1975, the firm acquired a Hewlett-Packard Co. HP 3000 CX minicomputer, as well as 10 staff members from the service bureau to ease the transition to a complete in-house system.

By last year, NPD was ready for an upgrade to two HP 3000 Series II computers, each with 512K bytes of main memory. The company now has 18 HP CRTs, four 150M-byte disk drives, six 50M-byte disk drives, eight tape drives, eight paper terminals, a 200 line/min printer and two 600 line/min printers.

The equipment is located at headquarters here, and additional CRTs link the company's Chicago office to the system over leased telephone lines. NPD's DP staff now numbers 30.

All of the monthly data gathered from around the country is coded manually by NPD's staff. The coding pads are then keypunched and transferred to magnetic tape (or to floppy disk and then magnetic tape).

From the tape, the information is sent to one of the HP 3000 Model 8 computers for editing. The system checks the information for completeness, consistency and correctness and prints out a complete list of the data with any exceptions flagged.

These lists are then reviewed manually and necessary corrections are fed back into the computer.

Processing and analysis of the data are performed by the other HP 3000. It selects the appropriate sampling of families from among the 50,000 to generate national or regional projections by such factors as family size, income level or ages of the children.

### Monthly Reports

NPD's clients, including most of the major package goods manufacturers such as General Mills, Quaker Oats, General Foods and Chesebrough Ponds, receive monthly reports of market trends and market shares. A client, therefore, can make marketing decisions based on an NPD computer model estimating the effects of different marketing strategies on each type of buyer — heavy, light and new. A computer-generated report

details the amount of new product sales volume that is incremental, the amount that is replacement and the conversion effects on each buyer type of various promotion vehicles (newspaper coupon, direct mail coupon or bonus pack).

Both short- and long-term forecasting projections of new products are made by the computer using sophisticated statistical models, while most data editing and processing are handled in batch through the computer's multiprogramming capability.

However, NPD is in the process of developing a sizable on-line data base for performing special analyses. This service will be based on data compiled over a 12- to 24-month period tracing the purchase patterns involved in more than three million transactions.

When available on-line, the data will enable NPD to respond to special customer inquiries rapidly and economically. For example, a client can investigate the causes of its product's regional strengths and weaknesses.

Such possible causal factors as loyalty, brand mixing and switching, and the effect of the home-delivered items (sold by companies like Avon, Fuller Brush and Amway) can be evaluated.

NPD continues to use a service bureau for part of its panel maintenance — monitoring and updating its files of families. "Our objective is to move all this onto the HP system as well," Catz noted. "We've found the system enables us to direct our energies where they are most important."

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## Mupac Adds Data Bus

BROCKTON, Mass. — Mupac Corp. has announced a family of four- and seven-position data and I/O bus backplanes to add flexibility to small systems packaging.

Eliminating the need to wire-wrap common signals of all panels, the data bus has 72 parallel lines connecting all pins of the 108-pin connector receptacles' A and C rows in the backplane, Mupac said. Thirty-six pins in the B row are not connected to the bus, allowing independent signal interconnection.

A 72-position I/O connector is common to the bus for connecting the bus signals to other rack assemblies or front panel system control, Mupac continued. The I/O bus is said to answer the problem of how to bring signals to and from a rack assembly with a wire-wrap backplane.

The backplanes cost \$37 each in quantities of 10 to 24. Mupac is at 646 Summer St., Brockton, Mass. 02402.

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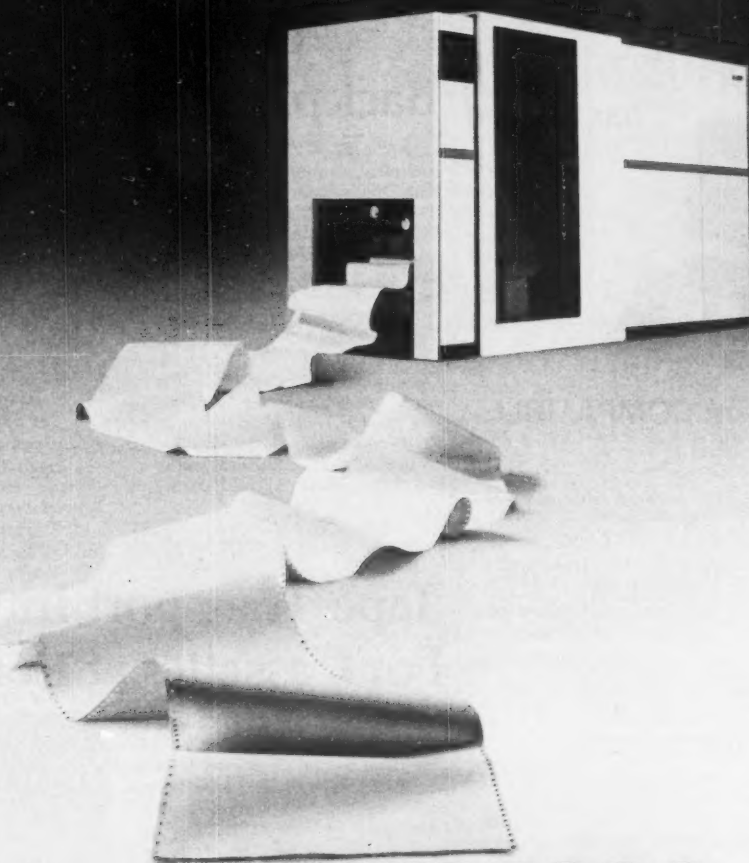
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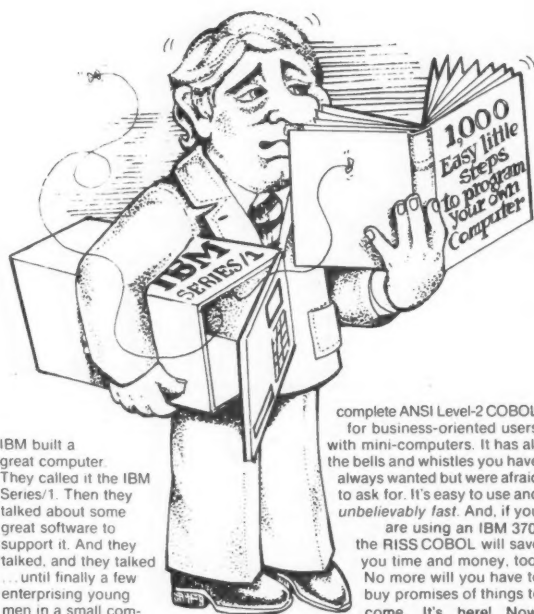
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## For Disk Controller

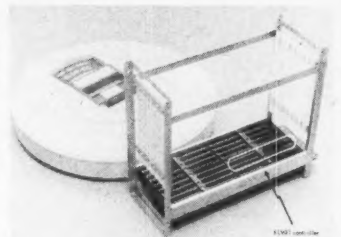
# Backplane Built for LSI-11

ORANGE, Calif. — An LSI-11 backplane/cardguide assembly for use with Digital Equipment Corp.'s RLV01 disk controller has been introduced by MDB Systems, Inc.

The MLSI-BPA84A backplane, with 16 dual slots, is a multilayer printed circuit with the two dual slots, 6 C-D and 7 C-D, wired to accept the DEC disk controller.

Unlike DEC's version, which has no Q-bus in columns C and D, MDB has wired the remaining six slots for Q-bus quad functions, according to an MDB spokesman. The unit therefore accommodates 12 dual or six quad boards in addition to the disk controller.

The BPA84A backplane for the DEC disk controller costs \$565. An MLSI-



MDB Systems Backplane

BALL rack-mount enclosure with two cooling fans costs \$325, and an internally mounted switching power supply costs \$450.

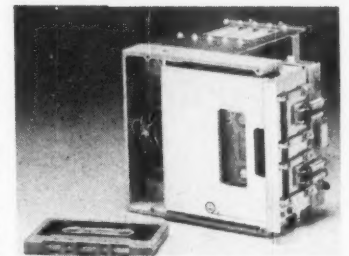
MDB Systems is at 1995 N. Batavia St., Orange, Calif. 92665.

# Tape Transport Introduced For Cassettes at 1,600 Bit/In.

ANAHEIM, Calif. — A 1,600 bit/in. digital cassette tape transport is available from Saylor Electronics International (SEI). The Model 4240's 4-track capability provides storage capacity comparable to that of 3M Co. cartridges at less cost and inconvenience to the end user, an SEI spokesman claimed.

The tape transport features 30 in./sec read/write and 60 in./sec search speeds for data entry or retrieval; ceramic edge-referenced tape guidance to within .1%; and modular construction said to fit most systems. To maximize reliability, pinch rollers and capstans were eliminated.

The Model 4240 cassette tape trans-



Model 4240

port costs \$1,700. No clocks or speed contained unit, SEI noted.

The company is at 1436 E. Katella Ave., Anaheim, Calif. 92805.

# Storage Subsystem Fits DSC Meta 4/5000 Mini

SAN DIEGO — Digital Scientific Corp. (DSC) has unveiled a 1.34 billion-byte storage subsystem for its Meta 4/5000 minicomputer.

The Model 5475 Extended Storage Subsystem includes a CPU interface, formatter/controller and from one to eight 200M-byte (168M-byte formatted) disk drives. The subsystem provides a considerably lower per-byte storage cost to Meta 4/5000 users than was previously possible, DSC claimed.

The Model 5475 features a seek overlap capability that allows multiple overlapped disk searches to be satisfied in fewer disk rotations, the vendor stated. The subsystem's average access time was put at 28.5 msec, while a maximum access time is reportedly 53 msec. Track-to-track access time is 6 msec.

The subsystem also offers error correction circuitry that corrects all errors of 11 bits or less, according to DSC. Furthermore, a dual-port access capability allows a common 5457 to share memory in on-line mode between two Meta 4 CPUs.

The subsystem's extended format feature allows both fixed- and variable-length records to be stored, while permitting IBM compatibility under software control, DSC continued. Finally, internal microprocessor control

and a high-speed cache buffer enable full-track reads in one disk revolution.

A minimum Model 5475 configuration costs \$43,795 and consists of a CPU interface, formatter/controller, disk drive, all the cables required for ac power and data transfers. The dual-port capability is tagged at \$8,270.

DSC is at 11425 Sorrento Valley Road, San Diego, Calif. 92121.

# Catalog Lists Mini Supplies

HOLMDEL, N.J. — A catalog of minicomputer supplies and accessories is available free from Misco, Inc., a small systems mail order house.

The spring catalog lists magnetic media, storage items, paper, labels, cables, ribbons, paper tape, computer room aids, terminal ribbons, print wheels, books and tools.

For example, Misco offers Verbatim data cartridges that suit IBM 5100 and 5110 minis, Syco Corp.'s 4450 and NCR Corp.'s 8130. With quantity discounts available, the cartridges sell for \$19.75 each and carry a one-year warranty.

Misco is located at 963 Holmdel Road, Box 399A, Holmdel, N.J. 07733.

# Users Gain Card Reader Options

## • Cardamation Offers Two

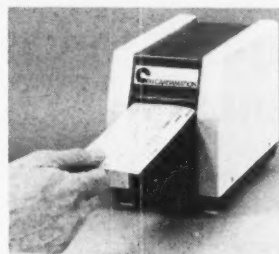
FRAZER, Pa. — The Cardamation Co. has announced the first two units in a family of hand-fed card readers that read mark sense or punch card data on 29-, 51- or 80-column tabulating cards. The units were designed to provide low-cost data entry for small systems and micro processors and communications terminals.

Less than 10 in. long, 7.5 in. high and 6 in. wide, HF-10/30 parallel reader can process longer tabulating cards appropriate for educational or special applications, the company said.

Single units costs \$1,150; OEM quantities of a similar model called the HF-10/05 are available.

The HF-10 family will be ex-

panded this summer to incorporate models with an RS-232C interface, compatibility with the Documation, Inc. HFR-1 hand-fed reader and units that interface to a variety of small computers, Cardamation said from P.O. Box 746, Frazer, Pa. 19355.



Cardamation HF-10/30

## • Chatsworth Presents One

CHATSWORTH, Calif. — A mark sense card reader which accepts cards of variable lengths marked with a standard No. 2 pencil has been introduced by Chatsworth Data Corp.

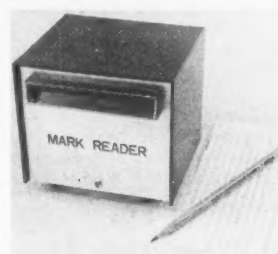
The MR-500 is hand-fed and measures 4.5 in. in all directions. The card data is converted to either Ascii or card image, the firm noted.

Special interfaces have been developed to connect the reader directly to the Radio Shack TRS-80, Apple Computer, Inc. Apple II and Commodore Business Machines, Inc. Pet Microcomputers.

The reader can be used in education to solve "queuing" problems in test scoring, attendance

and grade reporting and in teaching programming or in the small business market, where it can be used for inventory control, time cards and labor distribution.

The MR-500 costs \$750 from Chatsworth at 20710 Lassen St., Chatsworth, Calif. 91311.



Chatsworth MR-500

# User Reaps Mixed Harvest With Micro

By Ann Dooley  
CW Staff

GARDEN CITY, Mo — Garden City Implement Co. hopes to harvest money and time savings from its first attempt to automate its inventory system, even though the results have been mixed so far.

The farm equipment store had been run on a totally manual basis until February, when President Bill Troyer decided to install a microcomputer. Many of his friends and business acquaintances had been talking about automating with these low-cost systems, but since his business is relatively small — it grossed about \$500,000 last year — the company didn't need most of its functions automated. Troyer's parts inventory system was the only system he wanted to automate, at least in the beginning.

Inventory had always been maintained

with file cards that listed each item and the number of items in stock. However, cards were frequently missing and items were often listed incorrectly as being out of stock. The staff never knew exactly what was in the store's inventory at any one time.

Troyer decided to lease from H&K Computer Corp. of Kansas City, Mo., a Midwest Scientific Instruments Co. (MSI) System 12, which includes the MSI Model 6800 CPU with 10M bytes of disk, 56K bytes of random-access memory, a Lear Siegler, Inc. ADM-3 CRT, a multiuser Basic compiler and assembler and a 150 char./sec Texas Instruments, Inc. Model printer.

### Tracking Tractor Parts

The system was designed to control inventory, price parts automatically, generate invoices and provide a detailed overview of

fast- or slow-moving items, Troyer said. The inventory items consist primarily of heavy-duty tractor and truck parts.

The system enables employees at the counter to determine whether a part is in stock. Employees can also check into back orders or the pricing status of a part, answering customers' questions in a matter of seconds.

At the point of sale, all pricing and sales tax information is automatically extended and printed out in invoice form. The system also allows for the entry of nonstocked items, and the inventory files are updated so future inquiries reflect an accurate account of each item.

Placing an order with the supplier simplified by the system, which can produce a suggested reorder report, Troyer said. Installed in February, the system has not yet lived up to expectations, however. The staff is "getting to the point of being unhappy with it," bookkeeper Margie Curtis said.

According to Curtis, for the first few months since the system has been operating, "it's just created more work." During the installation, the list of inventory parts was "half in, and the system dropped it." It took about three weeks to get caught up again.

There have also been a few problems operating the system. "I don't know if [the vendor] didn't give us enough instructions or if

(Continued on Page 72)

# Intel Brings Out 8-Bit MPU Featuring 16-Bit Architecture

SANTA CLARA, Calif. — Intel Corp. has introduced an 8-bit microprocessor that features the 16-bit internal architecture of its 8086 system and the 8-bit bus interface of its 8085A.

The 16-bit internal structure of the Intel 8088 provides better performance than any 8-bit device and the 8-bit format makes the device compatible with most microprocessor system designs, the firm claimed.

The 8088 is completely compatible with the 8086 and features advanced arithmetic and Ascii data capabilities so that programs require fewer instructions and run faster than with other 8-bit machines, a spokesman maintained. The instruction set is structured for high-level and assembly language programming.

The internal architecture of the 8088 is essentially the same as the 16-bit 8086 and includes capabilities not found in other 8-bit microprocessors, the firm said. These include megabyte addressing, flexible addressing modes — two levels of indexing plus the displacement possible in a single operation — and instruction look ahead.

It also features 8- and 16-bit signed or unsigned hardware multiple/divide instructions, string-handling instructions and dynamic program relocation capabilities.

The 8088's internal architecture enables it

to process 8- or 16-bit data in single, string or block form. Sixteen-bit quantities are automatically fetched and written a byte at a time by the CPU.

The device also features special control lines to facilitate operation with multiple processors and shared resources, as well as to interface with the Massbus architecture.

The 8088 offers 20-bit addressing which means it can directly address up to 1M byte of memory; memory space is addressed in segments of 64K bytes. The device has 24 addressing modes including those with three levels of indexing summed, then added to the appropriate segment register to create the addresses.

The 8-bit bus structure was retained to maintain compatibility with existing hardware and to offer savings in drivers, transceivers and board space, Intel said.

The 8088 is divided into two processors — a bus interface unit and an execution unit. The first processor handles I/O data transfers and interfaces with memory; the second executes the instruction stream from the queue and manipulates the internal registers. The concurrent operation puts the memory access time at 460 nsec, according to the spokesman.

The 8088 costs \$124.80 from Intel, 3065 Bowers Ave., Santa Clara, Calif. 95051.

# Five More Formats Offered for 'Tiny-C'

HOLMDEL, N.J. — The Tiny-C interpreter is now available in five more formats: Radio Shack TRS-80 cassette, CP/M 8-in. soft-sectored and Micropolis Corp. 5-in. dual-or quad-density diskette, North Star Computers, Inc. 5-in. single-density diskette and a Digital Equipment Corp PDP-11-to-8080 cross-assembled version.

Tiny C is an operating system for a wide range of microcomputers, according to its developers, Tiny-C Associates.

The TRS-80 cassette version costs \$30; the CP/M and North Star version cost \$35; and the PDP-11-to-8080 versions costs \$35.

Documentation for the Tiny-C language and the interpreter is contained in the Tiny C Owners Manual, which is still \$40, the firm said. It can be reached at P.O. Box 269, Holmdel, N.J. 07733.

MICROCOMPUTING

# Assembler, Debugging Package Ready for 8080

BIRMINGHAM, Ala. — Southern Systems of Birmingham has introduced three products for the 8080 microprocessor including Raid, an assembly language debugging system, Remac, a macro relocating assembler and a floating-point package.

Raid includes more than 60 commands as well as features that make assembly language programming as easy as programming in Basic, the firm claimed. Raid is fully symbolic and includes a real-time interactive assembly capability that allows the user to key in instruction mnemonics for making on-the-spot patches.

Tracing facilities allow the programmer to execute a specified number of instructions in a single step and display selectively and programmatically

specified data in registers or in the memory. The registers are displayed numerically, and the user can select the number base.

The registers are also displayed in Ascii and/or symbolically and as either single 8-bit values or as 16-bit register parts.

Raid can execute code in a simulation mode so that the user's test program will be executed under total control, the firm said.

Raid is available on an 8-in. diskette for use under the CP/M, Isis-I or Isis-II operating systems. The CP/M version costs \$99.95 and the Isis versions are \$150. All are supplied with complete documentation, which is also available separately for \$15.

Remac generates an object module

that is fully relocatable and has the ability to use local symbols referenced within a small segment of the program only and not passed onto the master symbol table.

Remac is compatible with Raid and can nest macros and generate a complete listing. It is designed to run on any CP/M disk operating system and comes with documentation on an 8-in. diskette for \$99.95. The documentation alone is \$15.

The floating-point package includes a floating-point processor (FPP) that provides fast decimal arithmetic functions including addition, subtraction, division and multiplication. Documentation is available separately for \$10, and the FPP object code is available on either CP/M-compatible for Isis-compatible 8-in. diskettes for \$49.95. Southern Systems can be reached at P.O. Box 3373-A, Birmingham, Ala. 35205.

## Compcon to Cover Micros In Four One-Day Tutorials

SILVER SPRING, Md. — Four one-day tutorials on the theme of "Using

Microprocessors" have been announced by Dr. Portia Isaacson, general chairwoman for Compcon Fall '79.

The tutorials include "Distributed Computer Systems for Industrial Control" by Dr. James Schoeffler; "Design of Microprocessor Systems" by Dr. John Carson; "A Practical View of Computer Communications Protocols" by Dr. John McQuillan; and "Project Management of Microcomputer Development" by Eric Garen.

Compcon Fall '79 will be held Sept. 4-7 at the Capital Hilton Hotel in Washington, D.C. More information is available from Compcon Fall '79, P.O. Box 639, Silver Spring, Md. 20901.

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## User Reaping Mixed Harvest

(Continued from Page 71)

we didn't pick them up," Curtis said. At one point, the system had to be sent back because a part malfunctioned.

The programs were custom built for the company's needs, and it's taking some time to work them out, Curtis said, adding, "I guess it's a matter of getting it programmed correctly." The system has been operating much better since some of the adjustments were made.

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# With 4300 Deliveries Uncertain Demand Swelling for Leased 370/158s

By Marcia Blumenthal  
CW Staff

Speculation surrounding the delivery schedule for the IBM 4300 series of mainframes has created a booming demand for two-year leases of IBM 370/158s, according to lessors surveyed recently.

Spurred by demand that far outstrips supply, lessors are now commanding premium lease rates for Model 158s.

But the glow may only be temporary. Some lessors see the need to revamp overall lease rate structures in order to remain profitable.

Once IBM gets its 4300 leasing program off the ground, lessors will be entirely shut out of that market, according to William Grinker, president of the American Computer Group, Inc.

## Jump in Lease Rates

Since the announcement of the 4300 last February [CW, Feb. 5], "monthly lease rates on 158s for two- to three-year leases have gone up \$2,000 to \$3,000," Richard Forsythe, president of Forsythe McArthur Associates, Inc., pointed out. "There's a shortage of 158s for quick delivery."

In all, approximately 1,550 Model 158s are installed in the U.S., according to statistics gathered by International Data Corp. Of those, about 80% have been purchased.

In the near term, the supply of 158s will come from users who are upgrading to

IBM's 30 series, Grinker surmised. Those 158 users lucky enough to get an early 4300 delivery date will be another source of supply.

Although IBM was expected to announce 4300 delivery dates earlier this month, Forsythe said he has heard rumors that the schedule will not be released until June. One lessor speculated the announcement would not be made until July.

## Disappointment Likely

Regardless of the time the delivery schedule is made known, there will be a lot of disappointments. IBM is said to be planning to deliver only about 2,500 machines this year. Orders for the 4300 are rumored to range from 30,000 to 50,000, the lessors agreed,

pointing out that the number of "true" orders is another matter of speculation.

Lessors obtaining early delivery dates will be in a position to lease 4300s for even higher rates than IBM plans to charge. "Early machines will command premium rental rates," Michael Vargo, executive vice-president of CMI Corp., predicted.

Comdisco, Inc. has ordered \$50 million worth of 4300 hardware worldwide, and IBM approved the entire order, its president said. Forsythe McArthur ordered a "modest number of 4341s," and the other was honored, that firm reported.

On the other hand, Vargo said that IBM, using its credit rating method, cut CMI's order to a third of the quantity requested.

(Continued on Page 74)

# Chicago Bank Breathes Life Into Near-Bankrupt Telefile

By Marcy Rosenberg  
CW Staff

IRVINE, Calif. — After teetering near bankruptcy for nine months, Telefile Computer Corp. received eleventh-hour financing from its prime lender, which agreed to restructure the company's \$10.5 million debt.

The First National Bank of Chicago will also support product development of Telefile's long-delayed Xerox Sigma-compatible computer line. Telefile announced these computers in 1975, but doesn't expect to ship the first of the series, the Telefile 85, until June or July of this year.

Nevertheless, Telefile is depending on sales of these mainframes — initially as Sigma hardware replacements — to buoy its financial position and return it to profitable operations.

But the company may face stiff competition from Honeywell, Inc., which is trying to convert this Xerox user base to its CP6 software. Designed as an upgrade from Xerox's Sigma CP5 operating system, CP6 runs on Honeywell's Level 66 DPS/C mainframe.

Because of its arrangement with First National, Telefile remains optimistic despite its poor financial performance last year. The firm sustained consolidated net losses of \$5.2 million for fiscal 1978 ended Sept. 30, compared with the previous year's earnings of \$1.1 million, which were aided by a \$456,000 tax-loss carryforward.

The consolidated loss per share was \$4.32, down from fiscal 1977 per-share earnings of 51 cents plus a 34-cent tax-loss carryforward. Total 1978 revenues dropped 9.8%.

(Continued on Page 76)

# Amdahl Sees IBM Vulnerable

By Tim Scannell  
CW Staff

TORONTO — As king of the computer industry hill, IBM has endured countless competitive attacks and easily survived with little or no damage to its position or its image. However, the tide of battle is slowly turning.

Competition is closing in; the well-known computer manufacturer is now being challenged on all hardware and software fronts, according to Dr. Gene M. Amdahl, Chairman of Amdahl Corp.'s board of directors. There is "little expectation that IBM will technologically leap" from its competitor's grasp, as it has in the past.

Speaking here last week at Data 79, a three-day conference and exhibit focus-

ing on data communications, Amdahl said IBM is currently fighting the competitive wave by implanting "fear, uncertainty and doubt" into its marketing strategies — elements that "touch at [the

## CW At Data 79

user's] heart in the darkest moments of the night."

By "producing a great deal of worry in the computer marketplace as to what tomorrow will bring," the computer giant hopes to prevent the user from deserting

(Continued on Page 74)

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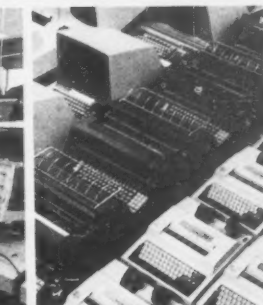
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## 'Fighting Smoke'

By a CW Staff Writer  
TORONTO — Understanding the present operational and marketing strategies of IBM is a little like "fighting smoke," Dr. Gene M. Amdahl, board chairman of the Sunnyvale, Calif.-based Amdahl Corp., said here last week.

In a press conference following a luncheon speaking engagement at Data 79, the controversial Amdahl — known as the father of IBM's 360 processor series — charged that IBM is deliberately misleading its customers into "conjuring up visions of changes of immense magnitude that might occur."

As an example, Amdahl stated that IBM is marketing its new DOS/VSE software by stressing its heavy

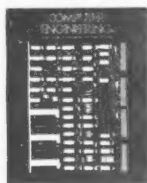
dependence on microcode when, in fact, such a concept would increase machine cycle time and blunt the package's competitive edge.

Amdahl said IBM may rue the day it became so large, pointing out the Amdahl Corp. is hot on its heels with "no competitors on the horizon."

When questioned about Amdahl Corp.'s growth rate in relation to that of IBM, the board chairman scoffed at the prospect that his corporation would give up its "David" philosophy in favor of becoming a positional "giant."

Finally, on the subject of acquisitions, Amdahl noted that his company's corporate route includes acquiring a few smaller companies.

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The three introductory chapters discuss computer systems from seven different perspectives: technology evolution; packaging and manufacturing. Five major sections follow: "In the Beginning" (transistor circuitry and DEC modules); "The Beginning of the Minicomputer" (18-bit computers, 12-bit computers, and structural levels of the PDP-8); "The PDP-11 Family" (from the beginning of the Family through VAX); "The Evolution of Computer Building Blocks" (RTMs, LSI processor bit slices, and multi-microprocessors); and "The PDP-10 Family." Three appendices cover the ISPS and PMS notations, and measuring computer performance. A bibliography and index are included.

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C5

## Demand Rising For Leased 158s

(Continued from Page 73)

Vargo thinks that IBM uses credit evaluations as a means of keeping equipment out of the hands of third parties, despite IBM's claim that it is treating all buyers equally.

The boom in 370/158 lease rates and premiums for early 4300 leases will be a relatively short-lived phenomenon. Shortened product life cycles for IBM equipment, exemplified by the sharp decline in the residual value of 370 equipment, call for new leasing strategies, some lessors said.

In an attempt to shorten the amortization of the cost of equipment, lessors may not discount lease rates as heavily as they have in the past.

"Lessors are not as aggressive as before in looking for residual values, so prices could be higher. But you've got to go along with IBM's rates," Vargo said.

Summing up the situation, Comdisco President Kenneth Pontikes said that lessors would try to remain under IBM's pricing level for a two-year lease, but would have to recover the cost of the equipment on a five-year basis in order to make a profit.

In the case of the 4300s, IBM's lease arrangement is so good that it will shut third parties out of that market, Grinker contended. However, the threat of a shutout does not seem to have deterred lessors from ordering 4300s.

As Grinker put it, lessors wouldn't stay in business if they derived their entire income from basic monthly lease rates; it's the brokerage that makes the business profitable.

## Supershort

Over the next three years, Systems Management, Inc. (SMI) will purchase more than \$10 million worth of Prime Computer, Inc. systems to penetrate new end-user markets with the acquired "supermini" capability. Prime will continue to service and support between 200 and 400 systems sold to SMI, which will include the 550, 650 and 750 models. SMI plans to add its own commercial and custom software to Prime systems it sells to first-time users.

## Amdahl: IBM Vulnerable To Competitive Attacks

(Continued from Page 73)

IBM in favor of another vendor, Amdahl said.

In its early years, IBM maintained its corporate "state of affairs" with very little effort and encourages a slow, consistent growth pattern; this strategy was apparently effective because by 1976, IBM customers had invested approximately \$200 billion in 360- and 370-related products such as applications software, peripherals and documentation, Amdahl said. Total price tag didn't include the initial cost of the mainframe, he noted.

However, the tremendous acceptance of the 360 and 370 machines had an undesirable side effect. When IBM introduced newer computers, such as the 30 series mainframes, users showed a reluctance to break away from the older systems. In response to this resistance, IBM dropped its hardware prices to "stem the tide of competition," Amdahl said.

But the price drop caused "considerable pain" for IBM, and the financial impact was reflected in the company's 1978 first-quarter earnings. If IBM's profits from currency exchange fluctuations and changes in the amount of earnings per share were extracted, IBM "made no gains in earnings whatsoever," in 1978, Amdahl pointed out.

Easing their current corporate strategy on the idea that a higher percentage of equipment must be purchased rather than leased, IBM executives concentrated "on bringing down the [hardware's] price/performance as rapidly as [the company] could tolerate," Amdahl's chairman said.

The company even let out a significant number of research and development contracts to the semiconductor industry when it found it wasn't keeping pace with the industry, he noted.

As a challenger, Amdahl Corp. will get much stronger as time goes on rather than "calm down and get more apathetic." Describing his company as IBM's chief competitor, Amdahl stressed that it will "shoot for those things that will show customers availability, reliability and maintainability" — while at the same time providing better support for its customers.



Dr. Gene M. Amdahl

Referring to IBM's anticipated H series announcement, Amdahl claimed that his company's technological lead will "be greater in that time frame than in the past."

The final payoff "is in the greater price-performance which the future will bring to [the user], no matter who is serving it up," Amdahl said.

## TRW Datacom Selling NBI Units

LOS ANGELES — Under a nonexclusive distribution agreement, TRW Datacom International, Inc., will support and market worldwide text processing systems manufactured by NBI, Inc.

The TRW subsidiary will offer NBI's System 3000 Paperwork Processor, an automated word processing system with terminal text editing capabilities, in some 40 countries outside the U.S. excluding France and Australia, where NBI maintains distributor agreements.

The international sales effort will target the NBI systems to the end-user stand-alone word processing market for high-volume general office applications.

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## EMM Arranging Licenses Abroad

ENCINO, Calif. — After withdrawing plans to market its small business system in the U.S. in early 1978, Electronic Memories and Magnetics Corp. (EMM) is attempting to arrange licensing agreements in countries in the Middle East and Far East.

Although the company claimed the product is competitive with small business systems of other U.S. manufacturers, EMM decided it was not feasible to market its System 800 in the U.S. because its planned distribution channel was inappropriate, a company spokesman said.

Instead of selling the system through distributors, EMM intended to establish its own direct marketing force.

But the firm shelved the idea of selling the system in the U.S., instead signing a licensing agreement with Hadrian Computer Services Ltd., giving that firm exclusive rights to market the system in the UK.

The agreement allows Hadrian to assemble the product and market it to UK customers. EMM supplies the sub-assemblies and the operating system, the spokesman said.

Currently, EMM is working on similar arrangements with several countries in the Middle East and Far East.

While EMM has no plans to market the system in the U.S. in the near future, it is still considering that alternative, the spokesman said.

## Nickels & Dimes

Dataproducts Corp. declared a semi-annual dividend of 15 cents per share to be paid June 22 to shareholders of record on June 5.

\$\$\$

Solid State Technology, Inc. has completed the private placement of \$2.5 million of common stock with Establishment Pradafant, Vaduz (FL), an investor group. These funds, along with an additional \$2.5 million anticipated from bank financing, will be used to implement the production and marketing of the Atena Dt/C 8200 terminals recently introduced. Delivery of the first terminal orders is expected within two to four months.

\$\$\$

Despite On-Line Systems, Inc.'s (OLS) losing a follow-on contract with the Department of Health, Education and Welfare, the agreement in principle under which United Telecommunications is to acquire OLS will not be affected. That agreement calls for the issuance of 1.2 shares of United Telecom for each share of OLS.

\$\$\$

The board of directors of Computer Vision Corp. approved a two-for-one split of the company's common stock in the form of a 100% stock dividend effective June 22 for shareholders of record on June 14.

\$\$\$

General Datacomm Industries, Inc. increased its line of credit from \$9 million to \$13 million at a rate of 1-1/2% over prime with no compensating balances required.

## Minis Spurring European Software Growth

NEW YORK — New applications for mini- and microcomputers will set the pace for continued growth in the European software package and packaged services market.

Two disparate trends will push this \$8.7 billion market to \$16 billion by 1986, according to a study by Frost & Sullivan, (F&S) Inc. here.

The first is a growing demand for low-cost, easy-to-use small system operating software and applications packages to bring computing resources to the first-time user.

In addition, the report predicts increased expenditures for the sophisticated operations and applications software called for in networking, packet switching and electronic

funds transfer.

Over the 10-year period from 1977 to 1986, computer software package sales in Europe will cumulatively total \$4.7 billion. F&S divides this market into four segments: operating systems, expected to represent sales of \$768 million by 1986; programming languages and aids, to climb to \$1.7 billion; system utilities, \$339 million; and applications software, \$2.5 billion.

### Businesses Created

Minicomputers will spawn several major software and services businesses in the next few years, the report added. These include batch processing service bureaus, software houses and systems houses.

Another burgeoning minicomputer-based software market will develop around growing use of multi-processor systems that perform dedicated functions via programmable read-only memory (Prom) with a central control processor. Currently pegged at \$1 million, this market will skyrocket to \$100 million, F&S predicted.

Unlike the U.S. software and services market, general-purpose packaged software supplied in Europe often must conform to national practices and conventions, the study pointed out.

The report, No. E268, is available for \$850 from F&S at 106 Fulton St., New York, N.Y. 10038.

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# 1.

### Our Preview Issue

On May 28th, our Preview Issue will cover everything that's coming up at NCC. We'll list the sessions, tell you who's speaking, review the exhibitors and what they'll be exhibiting, and even give you tips on what to do in New York in June. Don't leave for the show without this complete score-card under your arm! Extra issues will be distributed at the **Computerworld** booth at NCC. Color close is May 11, black and white, May 18th.

# 2.

### Our Show Issue

This is the issue we publish as the show opens. It'll have last-minute show information, speech previews and other show details. If you're there, pick up a copy at the **Computerworld** booth. Issue date is June 4th. Color ads must be in by May 18th, black and white by May 25th.

# 3.

### Our NCC Wrap-Up Issue

Before the hall gets cold, our staff of 20 editorial people will have prepared their reports and filed them in time to appear in this informative wrap-up issue. You'll read who said what, who introduced what and how it works, and review the show's features and highlights in words and pictures. Issue date is June 11th. Color ad close is May 25th, and black and white ads close June 1st.



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# Chicago Bank Revives Near-Bankrupt Telefile

(Continued from Page 75)  
to \$10.4 million from \$11.6 million in 1977.

For the first quarter of fiscal 1979 ended Dec. 31, 1978, Telefile reported losses of \$311,671 or 26 cents per share on \$3.3 million in revenues. In the comparable period last year, the firm sustained a loss of \$126,365 or 9 cents a share on revenues of \$2.5 million.

"We lost so much money last year that we were actually in a negative net worth position. We were technically bankrupt," Samuel V. Edens, Telefile chairman, said.

Edens attributes the company's financial troubles on-year to its delay in getting the Telefile 85 mainframes to market. "We were under-staffed and

overestimated our capabilities. And checkout took longer than we expected."

## Details of Financing

After month-long negotiations, First National agreed to convert \$3 million of the company's debt to a new series of 8% preferred stock which will become convertible after fiscal 1980 into common stock representing 40% of the firm's outstanding shares. About 1.2 million shares are currently outstanding and selling at \$4 a share, compared with an \$8 per-share high last July.

If the preferred stock is redeemed before Sept. 30, 1980, the bank will retain a 10% common stock interest in the company. The remaining \$7.5 million debt will be payable between Oct.

25, 1980 and May 25, 1984.

In addition, First National will lend Telefile up to \$1.5 million payable on demand, of which \$750,000 will be available after the company satisfactorily completes market studies in August to determine the size of the existing Xerox base and its potential for buying Telefile's new computers, Edens said.

He estimated that out of a total of 1,400 Xerox units installed in 900 U.S. sites, 600 sites will be ready to upgrade from Sigma computers. The dollar value of Xerox's worldwide installed base of some 2,000 units, including Sigma and other hardware, is pegged at \$800 million.

Projections indicate "we could sell about 105 Telefile 85 computers to

those 600 active candidates," Edens said, adding "we targeted sites fairly low because we don't know how long the customer base will wait for us."

## First of Quartet

The Telefile 85 is the first of four computers the company is developing to cover a performance range from just under to four times the performance of the Sigma 9. Three computers are said to be plug-compatible with and software-transparent to the Xerox Sigmas and will therefore run CP5 software.

Acknowledging "some competition" from Honeywell, Edens said his firm has a price advantage because Honeywell's CP6 operating system cannot run on Sigma hardware.

To go with Honeywell, a customer would have to scrap both CP5 software and Sigma hardware, a conversion process that could cost between \$1 million and \$5 million, he claimed. Depending on the configuration, Honeywell's Level 66 running CP6 software costs about \$1.8 million.

By comparison, the Telefile equivalent allows the user to continue to run the CP5 operating system and costs between \$1.1 million and \$1.2 million, according to Edens.

Further, Honeywell's contract to market and service the Xerox user base runs out in 1982, and Telefile plans to be ready to pick up the slack. After losing out to Honeywell in its bid for that contract in 1976, Telefile, unlike Honeywell, purchased "quite a bit of Sigma hardware, giving the firm rights, currently exclusive, to the CP5 and CPR software bundled with it," Edens noted.

Xerox spent more than \$100 million on CP5 and CPR operating systems software plus about another \$900 million on applications software. Telefile's strategy is to support that \$1 billion installed software base with a compatible hardware upgrade, Edens stated.

After saturating that market, the company plans to go after those markets Scientific Data Systems (SDS) targeted before selling the Sigma line to Xerox in 1969. Edens said these include university, scientific and engineering and time-sharing applications.

Despite a bullish outlook, Edens admitted the task to recovery won't be easy. Telefile lost some 55 employees during the six-month period from Sept. 30, 1978 to March 31. Losses spanned all operations areas including "some good people" from marketing, engineering and production, he said.



## ACM-SIGMOD 1979 International Conference on Management of Data

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### Preliminary SIGMOD Program

#### Tuesday, May 29

8:30 pm-10:30 pm Evening Registration  
and Reception

#### Wednesday, May 30

8 am-9 am Morning Registration

9 am-9:30 am Opening Remarks

9:30 am-11:45 am\*

#### A. Session: Database System

Implementation  
Murray Edelberg, Sperry Research Center

"The Use of Technological Advances to  
Enhance Data Management System  
Performance"

P. Hawthorn and M. Stonebraker,  
University of California at Berkeley

"Query Execution in Direct"

D. J. DeWitt, University of Wisconsin

"Access Path Selection in a Relational  
Database Management System"

P. Griffiths Selinger, M. M. Astrahan, D. D.  
Chamberlin, R. A. Lorie, and T. G. Price,  
IBM Research, San Jose, California

#### B. Panel: Future Trends of

Database Research

J. B. Rothnie, Computer Corp. of America

12 noon-1:30 pm SIGMOD Luncheon  
Speaker: L. G. Roberts, Chairman, Telenet  
Communications Corporation

1:40 pm-3 pm\*

#### A. Session: B-Trees

Ronald Fagin, IBM

"Multi-Table Search for B-Tree Files"

D. Lomet, IBM T. J. Watson Research Center

"Compact B-Trees"

A. L. Rosenberg, IBM T. J. Watson Research  
Center, and L. Snyder, Yale University

B. Panel: Information Retrieval and  
Database Management

G. Salton, Cornell University

3 pm-3:20 pm Coffee Break

3:20 pm-6 pm\*

#### A. Session: User Interfaces

C. J. Date, IBM

"FQL—A Functional Query Language"

P. Buneman and R. E. Frankel,  
University of Pennsylvania

"The Functional Data Model and the Data  
Language DAPLEX"

D. W. Shipman, Computer Corp. of America

"The Data Management Facilities of PLAIN"

A. I. Wasserman, University of California  
at San Francisco

"Data Abstraction, Views, and Updates  
in RIGEL"

L. A. Rowe and K. A. Shoens, University  
of California at Berkeley

B. Panel: Is Now the Time for Standards?

S. Madnick, Massachusetts Institute of  
Technology

#### Thursday, May 31

9 am-11:45 am\*

#### A. Session: Performance Issues

S. Bing Yao, New York University

"Performance Analysis of Three Related  
Assignment Problems"

C. T. Yu, University of Illinois at Chicago Circle

M. K. Siu and K. Lam, Hong Kong University

M. Ozsoyoglu, University of Alberta

"A Heuristic Approach to Attribute  
Partitioning"

M. Hammer and B. Niamir, Massachusetts  
Institute of Technology

"Evaluation of Transmission Requirements  
in Distributed Database Access"

G. Pelagatti and F. A. Schreiber, Politecnico  
di Milano

"Cost and Performance Analysis of Semantic  
Integrity Validation Methods"

D. Z. Badal and J. G. Popek, University  
of California at Los Angeles

B. Panel: Database Administration

J. Lyon, Colonial Penn Group

11:45 am-1:15 pm Lunch (Open)

1:15 pm-3:15 pm\*

#### A. Session: Database Concurrency Control

David W. Shipman, Computer Corp.  
of America

"An Optimality Theory of Concurrency  
Control for Databases"

H. T. Kung, Carnegie-Mellon University

C. H. Papadimitriou, Massachusetts Institute  
of Technology

"The Complexity of Testing Predicate Locks"

H. B. Hunt III, Columbia University

D. J. Rosenkrantz, SUNY at Albany

"Queueing Network Models for Concurrent  
Transaction Processing in a Database  
System"

K. B. Irani and H. L. Lin, University of Michigan

B. Panel: Data Dictionaries

R. Curcio and V. K. Whitney,  
Arthur D. Little Inc.

3:15 pm-3:30 pm Coffee Break

3:30 pm-5:30 pm\*

#### A. Session: Data Dependency Theory

A. V. Aho, Bell Laboratories

"Synthesizing Independent Database  
Schemas"

J. Biskup, Lehrstuhl für Angewandte  
Mathematik, insbesondere Informatik,  
Aachen, Germany

U. Dayal and P. A. Bernstein,  
Harvard University

"Testing Implications of Data Dependencies"

D. Maier, SUNY at Stony Brook

A. Mendelzon, Princeton University

Y. Sagiv, University of Illinois  
at Urbana-Champaign

"Normal Forms and Relational Database  
Operators"

R. Fagin, IBM Research, San Jose, California

B. Panel: Office Automation

M. M. Hammer, Massachusetts Institute of  
Technology

H. L. Morgan, Harvard Business School

6 pm SIGMOD Banquet—at New England  
Aquarium

#### Friday, June 1

7:45 am-9 am SIGMOD Business Breakfast

9 am-11 am

#### Session: Database Semantics I

Beatrice Yormark, Interactive Systems  
Corporation

"Extending the Data Base Relational Model  
to Capture More Meaning"

E. F. Codd, IBM Research, San Jose,  
California

"Null Values in Data Base Management—  
A Denotational Semantics Approach"

Y. Vassiliou, University of Toronto

"Improving Semantic Specification in a  
Relational Database"

E. Sciore, Princeton University

11 am-11:15 am Coffee Break

11:15 am-12:35 pm

#### Session: Database Semantics II

John M. Smith, Computer Corporation of  
America

"Design of Relational Views Over  
Network Schemas"

C. Zaniolo, Sperry Research Center

"Data Model Integration Using the Structural  
Model"

R. El-Masri and G. Wiederhold, Stanford Univ.

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## Joint Venture With Bell & Howell To Widen Distribution, Apple Tries Education

By Marcia Blumenthal

CW Staff

CUPERTINO, Calif. — Seeking to broaden its distribution channels and enter specialized markets, Apple Computer, Inc. recently made its first departure from its usual sales through computer stores.

Apple and Bell & Howell's Audio Visual Products Division, based in Chicago, entered into a joint venture agreement under which Bell & Howell will market a specially designed Apple II system to the education market.

Aside from the education market, Apple is evaluating other distribution channels and specialized applications for its products, according to Michael Scott, Apple's president.

Using its extensive distribution network of franchised dealers to market the Apples, Bell & Howell also will develop peripheral equipment and software for the microcomputers, Richard C. Fowkes, president of the

Audio-Visual Products Division, said.

Bell & Howell has long-standing contacts with education markets in which it sells school-type audiovisual equipment. The micro-based Apples are envisioned for use in aiding disabled children to learn and for computer-aided instruction for drills.

"Industry sources predict that the education field alone will spend in excess of \$400 million on microcomputer hardware and \$200 million on software programs in 1982," Fowkes said.

The Apples geared to the education market will have features not found in the standard line. For example, the Bell & Howell Apples will come in colors and be tamper-proof.

The two companies have not yet agreed on sales quotas. Bell & Howell is currently selecting franchises for this new program. Radio Shack and Commodore Pet, Inc. have al-

ready entered the education market.

Apple is planning expansion into OEM sales this year and is experimenting with a variety of retail outlets other than computer stores. Computer stores are not opening fast enough to warrant limiting sales to these channels, Scott explained.

In fact, Apple stopped selling to Byte Industries last month because Byte was not franchising stores at the rate promised, Scott claimed. Now Byte has sued Apple and Apple in turn, has filed a countersuit. (see story below).

To reduce its reliance on computer stores, Apple has been experimentally selling its products through "high-end hi-fi stores," Scott said. Team Electronics, a Midwestern

chain is showing promising results. An experiment with Federated Department Stores was not successful, and that project was abandoned.

As a result of these experiments, Scott said the company has learned that one of the keys to success in selling the systems depends on who is selling the product. A typical sale takes three hours of selling time and a lot of graphic presentation, Scott said.

### Apples for Oil Drilling?

Besides retailing and OEM sales, Apple plans to promote its processors for dedicated applications in specific industries. One application under serious consideration is monitoring the process of oil drilling, Scott said.

In addition to its traditional

hobbyist market, which industry experts think is quickly petering out, Apple is heavily targeting the "very, very small business," he noted. Typically this operation has less than five employees and sales of less than \$500,000. Scott noted, adding "there are 14 million businesses in this category."

Apple, naturally, plans a foray to the Big Apple for the National Computer Conference in June. Some products to be shown include small business software that performs general ledger and accounts receivable and accounts payable functions.

In addition, Apple will offer enhanced Pascal with graphic capability to augment the assembler and Basic languages currently used with the Apple.

## In First Round of Suit, Apple Bites Angry Byte

SAN FRANCISCO — Byte Industries, Inc. lost the first round in its suit against Apple Computer, Inc. which charges the Cupertino, Calif.-based microcomputer maker with attempting to eliminate Byte as a competitor by terminating a distributorship arrangement which was to run until this month.

The U.S. District Court of Northern California last month refused to grant a preliminary injunction that would have forced Apple to continue to sell its products to Byte pending the outcome of the lawsuit filed by Byte in March.

Byte's suit charges that Apple and "certain unknown co-conspirators" unfairly conspired to cancel purchase orders and to boycott Byte by refusing to do business with the company. The suit also charges that Apple broke an agreement to sell computers to Byte.

From Apple's point of view, Byte was not living up to its part of the arrangement, Mi-

chael Scott, president of Apple, said. Under the agreement, Byte was to franchise five stores per month, but at the end of last year Byte got out of the franchise business, Scott claimed.

Furthermore, Scott said, Apple could cancel the arrangement at its own discretion after the first six months of the contract, provided it gave Byte 30 days' notice.

David Pava, Byte's general manager, refused comment on the suit.

### Byte Seeks \$1 Million

Byte reportedly is seeking \$1 million in punitive damages and \$100,000 in compensatory damages from Apple. Estimating that Apple's products comprised 45% to 60% of its sales, Byte's suit specified that Apple's action "seriously threatened Byte's ability to stay in business."

Meanwhile, Apple has filed a motion to dismiss the case. That motion will be heard late next month in the U.S. District Court of Northern California.

If the motion is denied, pre-trial discovery will begin, according to Apple's lawyers.

In addition, Apple has filed a lawsuit in the Superior Court of Santa Clara County against California Business Financial, Inc., the guarantor of Byte's obligation to Apple. That suit seeks to recover \$108,000 in receivables allegedly owed to Apple by Byte.

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# FCC Gives Go-Ahead to GTE, Telenet Merger

WASHINGTON, D.C. — General Telephone and Electronics Corp.'s (GTE) proposed acquisition of Telenet Communications Corp. has been approved by the Federal Communications Commission (FCC).

The FCC ruled May 2 that GTE's ownership of Telenet's packet-switched network would not violate antitrust laws, provided certain conditions laid down by the commission are met. Telenet must operate as a separate subsidiary of GTE, with separate management, facilities and service offerings, according to the FCC decision.

The proposed merger, slated for completion by the end of the month, has been stalled since January, when the FCC began an inquiry into the pos-

sible anticompetitive effects of the merger on the U.S. telecommunications industry. GTE proposed to convert all 2,694,292 shares of Telenet's outstanding common stock into .7652 shares each of GTE common for a final price tag of approximately \$60 million for complete ownership of Telenet.

In granting the merger application, the FCC agreed with GTE and Telenet arguments that GTE is the only available source of investment capital for Telenet, capital which the two companies said is necessary for Telenet to remain competitive in the telecommunications market [CW, March 5, April 23].

However, in announcing its decision, the commission said "GTE's corporate history and

substantial presence in other telecommunications markets make it necessary to have a number of safeguards attached to the merger." As described by the commission, some of the safeguards are:

- Only Telenet shall market its services. No other GTE

company or affiliate shall formally market or advertise Telenet's services nor in any way assist in attracting users to Telenet.

- Telenet shall maintain functional departments separate from those of other GTE subsidiaries in the provision

of all functions, including accounting, advertising, research and development, marketing, operations and maintenance.

- Telenet shall obtain services, facilities, nonproprietary information and equipment from other GTE companies or affiliates only on the basis of an arm's length relationship which reflects the terms, prices and conditions which would be available to any non affiliated common carrier.

- Telenet is prohibited from exchanging proprietary information with other GTE companies or affiliates. Any information exchanged must be made available to any member of the public on the same terms.

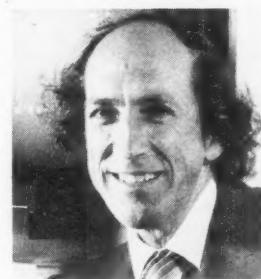
- All necessary financing of Telenet shall be provided by GTE holding company or by unaffiliated lenders.

## IBM Fellows Named

NEW YORK — IBM named three of its technical staff IBM Fellows recently, bringing to 46 the total number of Fellows currently active in the company.

Awards totaling \$500,000 were also given to 23 IBM employees for 17 different scientific and technical achievements.

As an IBM Fellow, an employee may work on a technical project of his choice for five years. The awards began in 1963.



Dr. Robert H. Dennard

sively in random-access memory products. He is a recognized contributor to silicon technology. His memory cell consists of a single field effect transistor and a capacitor.

Wiedmann was honored for his work in semiconductor device design, which has laid the foundation for the highly integrated circuitry found in today's computer memory devices.



David E. Cuzner

The new Fellows are David E. Cuzner, Dr. Robert H. Dennard and Dr. Siegfried Wiedmann.

Cuzner, director of IBM's UK Laboratory, devised new techniques for low-cost disk files. His co-invention, the swinging-arm actuator, has improved disk file price/performance and his sealed packaging concept has resulted in higher reliability for small disk files. These ideas have been incorporated into the 4300, 8100 and System/38 product lines.

Dennard is the inventor of the one-device memory cell, which has been used exten-



Dr. Siegfried Wiedmann

Dennard is with IBM's Thomas J. Watson Research Center in Yorktown Heights, N.Y., and Wiedmann is with IBM Germany in Stuttgart, West Germany, but is presently on assignment at the Yorktown Heights research facility.

## Executive Corner

- Stuart Goldsmith has been elected vice-president of corporate planning and development at Mohawk Data Sciences Corp. In addition, John A. Carr has been elected vice-president of the firm.

- Joseph F. Maronna has been appointed to the position of director of marketing at Megadata Corp.

- Frank H. Robertson has been appointed director of dealer operations at Microdata Corp.

- Bruce Adler has been named vice-president at Mitrol, Inc.; Jeffrey P. Stamen, vice-president for research and development; and Richmond B. Woodward, vice-president of customer services.

- Michael J. Baltosiewicz has been named vice-president of finance and administration and leasing at CMI Corp., while Fred R. Jones has been appointed vice-president of leasing at the firm.



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New York City, Melville, L.I., Westchester, Rochester and Syracuse, NY.
- Federal: DC/MD/VA: Maury Shyne (703) 827-9600, 1757 Old Meadow Rd., McLean, VA 22101.  
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- Midwest: Joe Elias (312) 364-3000, 703 West Algonquin Rd., Arlington Heights, IL 60005.  
Columbus and Cleveland, OH; Milwaukee, WI; Chicago and Peoria, IL; and Kansas City, KS.
- South: Rich Brown (404) 448-6072, 6855 Jimmy Carter Blvd., Suite 220, Norcross, GA 30071.  
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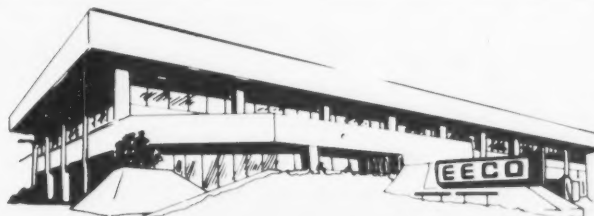
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**COMPUTER PROGRAMMER /ANALYSTS**

Any combination of training and experience equivalent to a degree in Business Administration, Mathematics, Computer Sciences or related fields plus two years experience with COBOL and/or FORTRAN on large timesharing systems. A background in CDC CYBER hardware with NOS/BE is preferred, but not necessary.

Must be a U.S. citizen.  
Resilient held confidential.  
Liberal fringe benefits.

**EQUAL OPPORTUNITY EMPLOYER - M/F**

Send resumes to:  
Ms. Trudie L. Rainey, M/S 567  
Reynolds Electrical & Engineering Co., Inc.  
P.O. Box 14400  
Las Vegas, NV 89114

**PROGRAMMING OPPORTUNITIES**

Southwest's largest fire and casualty insurance organization has openings in its programming staff. One opening for a trainee who has a data processing degree and one opening for an experienced programmer with 2 years COBOL experience. Our shop is large enough to be advanced yet small enough to offer all around experience. We operate 370-OS-VS-CICS-SPM Data Base Management Systems. If you are looking for a personal growth situation contact Louis Rosen.

**EMPLOYERS INSURANCE OF TEXAS**

P.O. Box 2759  
Dallas, TX 75221

equal opportunity employer

**EDP OPPORTUNITIES COAST TO COAST**

Robert Half, staffed by EDP professionals for EDP professionals with 60 offices throughout the U.S., Canada & Great Britain, is the largest network of personnel consultants in the Data Processing field. And its establishment in 1948 also makes Robert Half the oldest. One call and you can search the local, national and international markets. All fees are paid by client companies, of course. The following is a partial listing of opportunities and locations:

**TAMPA****TECH SUPPORT**

BURR 6700 or higher-MCP a must - NDL a plus - To 21K

**PROG/ANAL**

360/370 DOS/VS POWER Cobol. CICS and BAL a plus - To 19 K

**BAL PROG/ANAL**

Must have 2 yrs assembler 3031-OS-VS1 or MVS - To 18K

**BANKING**

Loans, savings, DDA - 1 yr or more - Cobol IBM or Burr - To 20K

**TP COORDINATOR**

Large 370 or 303X a must. VS1 or MVS - IMS - To 24K

**Stan Allen****ROBERT HALF**

of Tampa, Inc.

1311 N. Westshore Blvd.  
Tampa, FL 33607  
(813) 876-4191

**SAN ANTONIO**

Beautiful San Antonio offers you a better life-style and a better career path for managers, team leaders, programmers, analysts with the following positions:

1. Cobol, 1 yr + exper programming, 370/145, 148 DOS/VS plus ALC. Prefer banking exper, acctg applic's. Profit sharing plan . . . To \$24,000
2. BS Math, Comp Sci 2 yrs + exper. PL1 or FORTRAN S.P. Hardware. 370/168 VS/OS, AM-DAHL 470. Heavy IMS . . . To \$27,700
3. Degree Pref'd. COBOL TSO, JCL, IMS data base. 1 yr + 370 environ. Create maintain pgms. ASSY PL1 systems design, anal. Ins big'd . . . To \$23,000
4. 2 yrs + COBOL ASSY lang's exper. 370/OS/VS1 Conversion 3031, VSAM, CICS - + +. Banking Exper + + . . . To \$26,000
5. Degree Pref'd. 1 yr + exper COBOL, Burr's 3700 MCP NDL Utility, DC/DB. Banking applics + +. Acctg/Gen ledger. IBM/HONEYWELL equiv exp. \$20,000

Leon F. Stief

**ROBERT HALF**

First Nat'l Bank Bldg

Suite 340

San Antonio, TX 78201

(512) 736-2467

Joan Balto

(301) 323-7770

Karen D.C.

(301) 652-1960

ROBERT HALF

7316 Wisc. Ave.

Washington, D.C. 20014

**MINNESOTA****UNIVAC SYSTEMS****PROGRAMMER**

Outstanding company seeks person with 4+ years experience with Univac 494 or 1100 systems. Super benefits including free air travel. Salary in \$25,000+ range.

**DATA PROCESSING****MANAGER**

Rapidly growing local firm seeks experienced DP professional to take over developing department. Several years COBOL background on large scale IBM equipment with some supervisory experience required. Order entry systems experience a big plus. Salary to \$30,000.

Steve Gilata

**ROBERT HALF**

of Minnesota, Inc.

2236 IDS Center

Minneapolis, MN 55402

(612) 330-9001

**DENVER**

Computer professionals are in great demand in Colorado and the Rocky Mountain area. Join many of your colleagues who are advancing their careers while enjoying the splendor of the Rockies! Some positions available right now include:

Telecommunications-Voice Communications . . . \$30,000  
Programmer Analyst DOS/CICS . . . \$25,000  
Programmer-1 yr. COBOL exp . . . \$18,000  
For further information on how to find that right position in the Rockies, contact:

Steve Newman

**ROBERT HALF**

2 Park Central

Denver, CO 80202

(303) 629-1010

**NEW YORK****EDP AUDITOR**

You will have carte blanche to develop and implement your ideas with this national entertainment conglomerate. 3+ years EDP and audit review experience. Analyze the effectiveness of proposed and on-going systems. Key position on management team. \$30,000.

ROBERT HALF

522 Fifth Avenue

New York, N.Y. 10036

(212) 221-6500

**KANSAS CITY****MIS DIRECTOR**

National retail group in the mid-west has an immediate need for an aggressive corporate MIS Director. Viable candidates will have a proven track record encompassing large systems in a 370 Teleprocessing environment. Familiarity with Data base and data transmission in reference to point of sale and inventory control desirable. Salary to \$50,000.

**DATA PROCESSING****MANAGER**

Growth orientated midwestern manufacturer and distributor listed on the New York stock exchange seeks a cost effective Data Processing Manager. If you have 6 plus years commercial data processing with current systems and programming skills; have IBM equipment knowledge of systems III model 15/systems 34; and will accept the responsibility for the supervision of 25 plus people, this company wants you. Salary to \$35,000.

**DATA PROCESSING****MANAGER**

Kansas City based manufacturer/distributor seeks a fast track small shop manager. Position requires demonstrated ability to communicate with upper management, to translate ideas into workable productive systems, to provide leadership to a talented disorganized staff, and a bottom line business oriented approach to data processing. Expertise with large systems III preferred. Successful redirection of department leads to promotion to member of executive management team. Salary to \$32,000.

**DATA CENTER****MANAGER**

Rapidly growing midwestern national firm seeks a foresighted operations manager. Position requires the ability to plan and coordinate a seven day three shift operation. Rapid growth requires the ability to double the staff and plan for a new data center layout. Prior experience in an OS and teleprocessing environment required. Salary to \$26,000.

**SYSTEMS PROGRAMMER**

Because of this fortune 100 company's fast growth they are seeking a systems programmer with a minimum of six months experience in the systems area. Individuals should have a working knowledge of assembler; OS experience is preferred but not required. Exposure to 3790 distributive processor and its host software is a plus. The current shop is a MVS 168 running CICS VTAM ACF with one of the largest TP networks in the Midwest. First responsibilities will be working with CICS and or CICS program products. Salary to \$26,000 with an excellent benefit program to include an incentive plan.

**SENIOR DATA BASE****ARCHITECT**

Suburban Kansas City state of the art 3033 MVS shop is expanding their data base group. Prior data base experience is required with one year IMS experience or all the IBM courses on IMS must have been taken. Must have the ability to do randomizing routines & performance analysis and evaluation. Salary to \$27,000.

**LEAD ANALYST/****PROJECT LEADER**

Corporate level position for analyst with solid financial systems design and implementation experience. Manufacturing company background preferred. General ledger, billing, A/P A/R, payroll systems are the keys. Have total project responsibility for new corporate financial system. Outstanding peer group in sophisticated 370 installation in greater Kansas City. Salary to \$25,000.

**SENIOR PROGRAMMER/****ANALYST LEARN IMS**

Three years DOS/VS experience or two years OS experience with ANSI COBOL qualifies for this staff expansion. Large state of the art 3033 shop is expanding their programming group by 20. All work will be new development and require the learning of IMS DB/DC. Structured programming is a plus. Salary to \$22,500.

**PROGRAMMER/****ANALYST**

Ground floor opportunity exists in this current 370/115 DOS/VS shop. Current plans call for the staff to increase from four to ten programmers over the next 18 months with a 4341 on order. Excellent opportunity exists for an experienced programmer/analyst to assume project leader responsibilities within the first six months. Education will be provided for CICS and DL/1. Salary to \$21,500.

**JR. ANALYST**

Major Kansas City corporation is willing to train a jr. analyst. If you have one to two years of programming experience in either an OS or DOS/VS environment with structured techniques you may qualify. Position requires no programming. Company provides latest state of the art training. Salary to \$20,000.

**PROGRAMMER/ANALYST****RPG II**

Midwestern state of the art system 3 model 15D utilizing CCP in a manufacturing/distribution environment seeks a task orientated programmer. Position requires solid RPG II fundamentals, prior usage of tables and arrays, and the desire to develop and design new manufacturing systems. Company has two systems 38's on order. Position leads to divisional systems manager. Salary to \$22,000.

All fees and expenses paid by client companies. For confidential review where you might fit, contact:

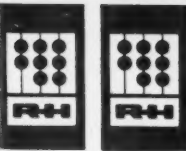
Mr. George Waterman

ROBERT HALF

127 W. 10th

Kansas City, MO 64105

(816) 474-4583



# ROBERT HALF

## DALLAS

The demand for EDP professionals continues extremely high in the DALLAS area... we currently have an immediate need for professionals at all levels... salary ranges in the DALLAS area: with in-house information on each position. We also have the sophisticated skills required to represent you ethically and effectively. All inquiries held personal and confidential. All fees, interview, and relocation expenses are completely paid for by our client companies.

Below are a FEW of the large variety of positions (many exclusively ours) currently available:

**PROJECT MANAGER** .....To \$30,000  
Manufacturer - DDP - 33033's  
**SR. SYSTEMS PROGRAMMER** .....To \$30,000  
Oil & Gas Co. - SNA - MVS  
**TECH SUPPORT MGR** .....To \$29,000  
Energy Co. - 3032's - MVS  
- TSO - CICS  
**LEAD PROGRAM ANALYST** .....To \$28,000  
Insurance Co. - 370/168's - ALC  
**APL PROGRAM/ANALYSTS** .....To \$28,000  
Transportation Co. - APL Professionals  
**DBA** .....To \$28,000  
Manufacturer - Solidly Supports IMS/VS  
**PROJECT LEADER** .....To \$28,000  
Life Insurance - CFO - ALIS - 370/158  
**SR. ANALYST** .....To \$27,000  
Oil Equipment Mfg. - IMS/VS - Financial Systems  
**CONSULTANT** .....To \$27,000  
National CPA Firm - MBA A Plus  
**SYSTEMS ENGINEER** .....To \$27,000  
Develop Original Software Systems/Minis  
**TIME SHARING COORDINATOR** .....To \$27,000  
Manufacturer - Heavy User Interface  
**T. P. SPECIALIST** .....To \$26,000  
Distribution Co. - 370/168's - ALC - VTAM  
**SYSTEMS PROGRAMMER** .....To \$25,000  
Bank - 370/158 - DOS/VS - CICS  
**SR. PROGRAM/ANALYST** .....To \$24,000  
Manufacturer - 3032's - CICS/VS - New Systems  
**LEAD PROGRAM/ANALYST** .....To \$24,000  
Bank - 3033's - Large Scale Systems Development  
**SOFTWARE SPECIALIST** .....To \$24,000  
Mfg. - Intel 8080 Process Control  
**PROGRAM/ANALYSTS** .....To \$23,000  
Transportation Co. - COBOL - CICS  
**PROGRAM/ANALYSTS** .....To \$22,000  
Oil & Gas Co. - New IMS/VS Systems  
**PROGRAM/ANALYSTS** .....To \$21,000  
Oil & Gas Co. - CICS/VS - COBOL  
**PROGRAM/ANALYSTS** .....To \$20,000  
Conglomerate - New 3032 Installation - COBOL  
**PROGRAM/ANALYSTS** .....To \$19,000  
1-2 Years COBOL or ALC - IBM Technicals

Please rush your letter or resume on a strictly confidential basis to:

Ron Urbach, CDP  
Two Northpark East  
Suite 750  
Dallas, Texas 75231  
(214) 363-3300

## ST. LOUIS

**PROJECT LEADER**  
TO \$30K

To develop financial applications. Degree, 5 yrs. Systems and Proj. Management experience qualifies you for this autonomous, corporate level position.

### UNUSUAL OPPORTUNITY!

**SENIOR PROGRAMMER**  
ANALYST TO \$23K

Degree, high grade point for Professional-State-of-the-Art Shop. 3 yrs. COBOL, On-Line, Mfg. or retail experience.

### REAL OPPORTUNITY!

**EDP AUDITOR**

TO \$18K

Degree-Accounting or Bus. with 18 hrs. Accounting. 1 yr. COBOL/RPG II Prog. Will develop Audit Programs for Sys. 3's in plants.

### EXCELLENT GROWTH!

**EDP CONSULTANT**  
TO \$21K+

Degreed with 2 yrs. design, prog. exp. for CPA firm. Will perform feasibility studies, systems design and audits.

### UNLIMITED POTENTIAL!

**SR. PROGRAM/ANALYST**  
TO \$25K

Progress to DP Manager after you develop and install systems and computer for this financial institution. OUTSTANDING opportunity for motivated Prog/Anal. to establish and manage shop!

### STAFF ENGINEER-MINING

TO \$37K+

Degree in mining, Engr. Physics or math & at least 8 yrs. exp. in mine operations and electronic design or computer program development qualifies you for this TOP ENGR. POSITION with TOP FIRM! Great Benefits!

### STAFF ENGINEER DIGITAL

DESIGN TO \$36K+

Degree in Physics, EE, at least 6 yrs. exp. in Digital Design-I/O devices, Micro applications provides OPPORTUNITY to join 1st rate company!

### ELECTRONICS ENGINEER

TO \$36K+

B.S. or advanced degree in Electrical Eng., Computer Science, Physics, or Math with 6-10 yrs. exp. in the design and programming of computer software and micro programs. Prefer exp. in system software (operating systems, compilers, etc.) PDP-11 assembly lang., and telecommunication, switching systems.

### SUPER FIRM-OPPORTUNITY!

**MANUFACTURING**

**DEVELOPMENT SPECIALIST**

TO \$35K+

EXTRAORDINARY OPPORTUNITY for degreed (Physics, Electrical or Chemical Eng., Electronics) with 10 yrs. exp. in Electronic Mfg. Systems. Will research & develop laser, optics, fiber optics, chemical compounds technology for electronics, infrared, & robotics systems.

### EXCELLENT VISIBILITY!

**RPG II PROGRAMMER**  
TO \$15K

EXCITING OPPORTUNITY for sharp individual with one year solid exp. in RPG II programming, preferably on IBM Sys. 34. Leads to Systems Analyst position!

## COMPUTER OPERATOR

TO \$12K+

Client needs self-supervising operator with 3 to 5 yrs. exp. on large system, (IBM 370 or equiv.) batch environment. 3 on, 4 off work week. Person will work alone. UNIQUE FIRM!

Charles Shaffer

or

Beth Meoli

ROBERT HALF

of St. Louis

7733 Forsyth Blvd.

St. Louis, MO 63105

(314) 727-1535

## HOUSTON

If you want to move to the sunny South, then you need someone to represent you that knows data processing from the professional, career growth side, and who knows the Houston companies' Data Processing Management. I represent small, medium and large DP shops, and there are definite openings for PROGRAMMERS, ANALYSTS, PROJECT MANAGERS, SOFTWARE SUPPORT and on and on. Salaries range from \$15,000 to \$38,000. I have personally reviewed some of these companies' career paths, and they lead up through data processing as well as some that have career paths up and out of data processing. Call me COLLECT or send a copy of your resume to my attention:

Jim Fleming

ROBERT HALF

of Houston, Inc.

4801 Woodway, Suite 231W

Houston, Texas 77056

(713) 961-3271

## NEW ORLEANS

D.B. ANALYST

Banking helpful, 370/OS/VS, IMS, TSO 3 yrs. exp. \$22,000.

COMM'L PROG

1-3 yrs. exp., IBM 370/OS, PL1, Cobol or Fortran .....\$18,000.

PROGRAM/ANALYST

Degree, Univac 1108, Scientific appl. ....\$25,000.

SR. SYS. ANALYST

5 yrs. exp. DOS/VS, Cobol, Assembler, CICS .....\$20,000.

Jerry Brown

ROBERT HALF

of Louisiana

135 St. Charles Ave.

New Orleans, LA 70130

(504) 524-3773

## ALBUQUERQUE

NCR

Asst. Manager for expanding New Mexico mini-conglomerate. NCR Centurion in Cobol and Natl/3. Install on-line system. \$25,000 range.

IBM SYS 3

Several positions in this area ranging from P/A to Asst. Manager to Director. Extensive knowledge of RPG II, CCR. Salary \$16-\$25,000 dependent upon qualifications.

COBOL

Expanding uranium/energy companies. IBM large scales in Cobol. 1 to 3 years Cobol exp. required. Primarily new projects. \$18-\$22,000 range.

Dick Starnes

ROBERT HALF

of New Mexico

P.O. Box 3320

Albuquerque, NM 87190

(505) 266-5557

## PACIFIC NORTHWEST

Combine a vacation to the beautiful Pacific Northwest with a job search arranged to match your qualifications to our client's requirements. The Seattle/Tacoma metropolitan area is booming with a strong demand for experienced data processing professionals. Call collect now to confidentially discuss job opportunities or rush your resume. Here is a summary of our current jobs:

### SYSTEMS ANALYSTS/

PROGRAMMERS \$14K

to \$27K

Several openings for COBOL programmers and analysts with large-scale IBM 380/370 experience in construction, consulting, health care, finance and forest products industries. Excellent career positions with solid firms. Several openings for experienced RPG II IBM S/3, S/32 and S/34 programmer/analysts who can move up to EDP management in smaller firms.

EDP AUDITORS

\$18K to \$28K

Several openings for EDP auditors with light to heavy experience in financial and manufacturing industries. Good verbal/technical skills needed. Programming experience very desirable. Excellent way to get top management exposure quickly.

Ray Magill C.D.P.

ROBERT HALF

of Seattle, Inc.

1301 5th Avenue,

Suite #2626

Seattle, Washington 98101

(206) 624-9000

## MIAMI

Our progressive Florida clients are currently searching for ambitious, self-motivated DP professionals. These clients offer the latest in hardware/software opportunities. South Florida's average year-round temperature is 75.4 which offers more than 3000 hours of glorious sunshine. Don't wait until next winter.

ANALYST/PROGRAMMER

Candidates must have 3+ years experience in financial systems design. COBOL is a must - any hardware. Salary to \$20,000.

CICS ANALYST

Several of our clients urgently need programmers with experience using CICS/VS, both software and systems applications. BAL is a plus. Salary to \$22,000.

Chuck Hall

ROBERT HALF

of Miami, Inc.

1395 N.W. 167th Street

Suite 100

Miami, FL 33169

(305) 625-5433

## CHICAGO

**MANAGERIAL TALENT?**  
**HEAVY TECHNICAL**  
**BACKGROUND?**

MBA with heavy MIS director qualities. Excellent technicals in a COBOL/IBM 370 DOS/VS environment. No travel! \$27,000. Head up this in-house MIS Task Force. \$15MM company with new, well-integrated Data-point ARC system.

\$30,000.

Heavy technical person with accounting or finance degree to manage data center, develop software, consult internally.

\$25,000.

Call "Nielsen" (like the ratings) at:

ROBERT HALF

of Chicago

35 E. Wacker, Suite 468

Chicago, IL 60601

(312) 762-6900

## BOSTON

IMS ANALYST

Leading electronics mfr. seeks innovative IMS Analyst to design, code & implement new data bases. IBM 370 OS/VS COBOL environment. Interview & reloc. paid. Salary \$23,000 range.

COBOL ANALYST/

PROG.-MAINE

Prestigious consumer goods mfr. requires analytical & detail-oriented programmer to support new & existing systems. State-of-the-art IBM environment. Interview & reloc. paid. Leads to team leader. Salary \$16,000 range.

TECH WRITER

Fast-growing computer vendor has need for creative tech writer to develop user & applications documentation. Hvy. customer interface. Unlimited growth oppy. Interview & reloc. paid. Salary \$20,000 range.

SR. SYSTEMS PROG.

Major industrial goods mfr. seeks indiv. with IBM 370/135 DOS/VS, CICS, BAL & COBOL exp. Excellent oppy for hands-on software spec. Salary \$25,000 range.

PL-1 ANALYST

Established fin'l services org. requires solid PL-1 skills for development of on-line retrieval systems. Mostly new development proj's. in creative environment. Interview & reloc. paid. Salary \$20,000 range.

Gerry Battista

ROBERT HALF

of Boston, Inc.

100 Summer Street

Boston, MA 02110

(617) 423-1210

## PROVIDENCE

D.P. MANAGER

We are searching for a professional D.P. Manager who has the ability & desire to run a start-up operation with an IBM Systems 34 - Heavy RPG II/On-line exp. Growth is assured. Salary \$25,000.

PROGRAMMER/ANALYST

Insurance Applications. Min. 2 yrs. COBOL/CICS. Work with top management. Design, program systems. High visibility. Salary \$23,000.

PROGRAMMER

Excellent oppy. if you have a min. of 2 yrs. using COBOL in IBM 370 DOS or OS/VS environment. Salary \$18,000.

Dee Eckers

ROBERT HALF

of Providence, Inc.

400 Turks Head Building

Providence, RI 02903

(401) 274-6700

## HARTFORD

MINI SPECIALISTS

Conn. openings for indivs. w/ DEC-10 or PDP/11 software exp. Excellent oppy. for design of new distributed processing systems. Live in excellent recreational areas. Salary to \$26,000.

SOFTWARE SPECIALISTS

IBM/MVS, CICS or IMS tech. bkgrd. qualifies for Conn. openings. Oppy's exist at Sr. Corp. level w/promotion leading to tech. mgmt. resp's. Salaries to \$30,000.

PROJECT LEADERS

Indivs. with current COBOL-oriented prog./analysts or sys. analyst resp's. seeking to move into supervisory positions qualify for three new oppy's. in mfg. & fin'l/svs. systems. Salaries to \$25,000.

MGR. SYSTEMS/PROG.

Sr. Tech. mgmt. opening for indiv. to direct all IBM/MVS software support. Very visible position to move into latest state-of-the-art IBM DB/DC projects. Salary to \$29,000.

PROJECT MGR.

Prestigious Conn. client creating new function for indiv. to direct MVS/IMS oriented projects. Very promotable position leading to exec. level. Starting salary to \$30,000.

Stan Durbas or Paul Meisner

ROBERT HALF

of Hartford, Inc.

111 Pearl Street

Hartford, Conn. 06103

(203) 278-7170

## BUFFALO

SYSTEMS ANALYST

Profitable division of major building prod. co. needs solid systems pro. to step in & handle the full gamut of design resp. Data center is presently being underutilized & primary function is to design & impl. an order entry system. Systems 34 is ideal. Deg. req. Full reloc. pkg. \$24,000.

PROJECT MGR.

High profile MIS dept. located in W.N.Y. needs mgr. w/solid mfg. co. orientation. Will head up sys. devel. effort. Position requires up thru the ranks record + present superv. resp. Fast track environment. MBA best. \$30,000.

PROGRAMMER/ANALYST

Unique position for BASIC &/or FORTRAN to step into sophisticated DEC shop. Mfg. co. exp. best for this ground floor oppy. Will be involved in real time process control analysis. Deg. req. \$20,000.

P. Siegal

ROBERT HALF

of Buffalo, Inc.

1310 Liberty Bank Building

Buffalo, N.Y. 14202

(716) 842-0801

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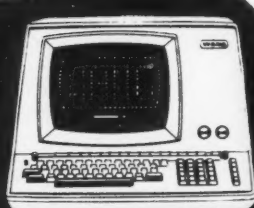
position announcements

position announcements

position announcements

position announcements

## SYSTEMS ENGINEERS and CUSTOMER SUPPORT REPS



Isn't it time you joined a company that's most assuredly "on the move"? 10 years ago, we conceived of an innovative approach to meeting unique data processing needs of ALL businesses ... large and small. Our creativity in developing solutions to problems unmet by our competition has resulted in unprecedented success. We are now recognized as one of the 10 fastest-growing companies in the U.S.! Our current sales effort (almost \$300 million) is extensive with 1979 promising even greater rewards! Due to this exciting expansion, we currently have **OPPORTUNITIES** for:

### SYSTEMS ENGINEERS

- 205 experience in COBOL, RPG II, Basic or Assembler; combination of languages preferred
- DBMS desirable
- Experience in interacting with users

Responsibilities include providing pre-sales technical support, benchmarks, systems assurance, and post-scale customer consulting.

### CUSTOMER SUPPORT REPS/DATA PROCESSING

- 1-2 years experience in Data Processing
- Ability to train users
- BA required

This person will work directly with our customers and software vendors in coordinating the installation and implementation of our hardware.

### CUSTOMER SUPPORT REPS/WORD PROCESSING

- 1-2 years experience working with Word Processing Systems
- Ability to train customers in use of Word Processing
- Good communication skills

Responsibilities entail pre-sales demonstrations of our Word Processing Systems, post-sales customer training and support.

All positions offer high visibility and ample opportunity for continued growth as well as a lucrative salary structure which is complemented by a very generous benefit package. We invite you to submit your resume, including salary history and requirements, in confidence to J. Sabatino, District Systems Manager, Wang Laboratories Inc., Suite 1100, 444 N. Michigan Ave., Chicago, Illinois 60611, 312-321-6460.

**WANG**
**LABORATORIES, INC.**
*an equal opportunity employer m/f*

### SYSTEM PROGRAMMER

Entry level position available for MVS System Programmer with a minimum of four years assembler language experience. Responsibilities include systems maintenance, performance analysis and technical writing. Degree in computer science or related field is required. Send resume and salary requirements to:

**SAN DIEGO GAS  
& ELECTRIC COMPANY**

Employment Office  
P.O. Box 1831  
San Diego, CA 92112

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and an Equal Opportunity Employer

### ARE YOU A GOOD PROGRAMMER WITH A SALARY IN THE TEENS?

You're in demand from coast to coast, and we can prove it! No cost ... all fees are paid.

Send us your resume and salary requirements today! We'll give you personalized service!

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13773 N. Central Expwy.  
Suite 1305  
Dallas, Texas 75243  
Personnel Consultants

### 25 START-AT-HOME COMPUTER BUSINESSES

"Low-Capital Startup Computer Businesses," a 156 page research report, covers consulting, contract programming, software packages, micro computer ventures, moonlighting, marketing, success secrets, failure signals, financing, professionalism and much more ... No EDP career tool like it anywhere. \$20.00 (check/Visa/Mastercharge) 30-day refund guarantee, to **DATASEARCH INCORPORATED**, 4954 William Arnold Rd, Dept-2, Memphis TN 38117. Phone orders 901 382-0172.

### SYSTEMS PROGRAMMERS

International Paper Company has immediate openings for System Programmers to work in our southern regional computer center in Mobile, Alabama.

We seek qualified individuals with a minimum of two years experience as a systems programmer actively supporting MVS, TSO, VTAM or TCAM.

International Paper offers above average benefits, relocation expenses, and an excellent work environment. Please send resume, salary history, and salary requirements to:



**INTERNATIONAL  
PAPER  
COMPANY**

Jerry T. Upchurch  
Supervisor Technical Devel.  
International Paper Company  
P.O. Box 2987  
Mobile, Alabama 36601

### Data Processing

- PROGRAMMERS/SYSTEMS ANALYSTS
- EE's (with software specialty)

**Here's how NCR's world  
leading financial  
terminals will make  
you a leader, too.**

We've revolutionized banking operations at NCR and our leadership will mean a future of challenging assignments — in the forefront of the continually expanding financial terminals field.

As a programmer analyst, you'll have total systems involvement and will see your contributions as an integral part of working, state-of-the-art systems. Show managerial ability and management responsibilities will come fast. Terminals make the system at NCR/Dayton. They also make new leaders.

Right now we have openings for EE's and programmer/analysts with a background in Assembly and COBOL languages and experience in:

- Microcomputers
- Minicomputers
- Operating systems
- Distributed Processing Systems
- Communications software

We also offer an outstanding compensation and benefits package and a location that offers friendly, lower-cost mid-western living at its very best. If you have the skill to make significant contributions to new generations of intelligent terminals, get in touch with us. Send resume and salary history to: Mrs. Judith E. Chorazewitz, Engineering & Manufacturing — Dayton, Employment Dept. D50, NCR Corporation, Dayton, Ohio 45479.

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We have a new department at our headquarters in sunny Fort Lauderdale. It's our own MIS Group. And we need professional help in making this department's function successful. If you're qualified and can help us do the job — we need you. And we reward accomplishment. You can assume major project responsibility rapidly, and you can count on the support of management.

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We seek candidates with experience in a manufacturing environment qualified to contribute to the development of a new MIS system utilizing IBM 360/50, OS/HASP interfaced with front-end minicomputers. Degree in Computer Science, Math, Information Systems or equivalent preferred.

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We seek a Project Leader for implementation, modification and maintenance of integrated manufacturing software. 360 OS environment applicant should have demonstrated abilities in systems analysis and COBOL Programming. Prior experience with MAS-1.5 software is a plus.

We offer highly competitive salaries and substantial fringe benefits including dental insurance and a stock-purchase plan. If you are interested in finding out more about these exciting career openings with MODCOMP, please send your resume including salary history, or call 800 - 327-8997.

Dick Green

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1650 West McNab Road  
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### FLORIDA SOFTWARE TECHNICAL WRITER

Leading data processing communication and peripheral manufacturer located in sunshine state is looking for talented Software Writers to form a new department. Experience in the areas of software writing for user oriented terminal systems or large scale IBM computers or mini computers is desirable. Please submit resume including salary history or call:

**FRANK LEONARD PERSONNEL**  
1211 North Westshore Boulevard  
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813-872-1853

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## NEW ENGLAND

### PROJECT MANAGER \$23-28,000

Newly created position in SOUTHERN MASS. requiring 3 years of MERCHANDISING/RETAIL experience in the areas of Merchandise Planning, Open to Buy, Distribution, Unit Control Reporting and Analytical Merchandise Reporting. Candidate should have 5-10 years Business Applications experience in system design and programming. SOFTWARE-COBOL. HARDWARE-IBM. Basic function is working with users to design and implement Data Processing systems.

### SR. SYSTEMS

#### ANALYST

\$23-28,000  
Newly created position in RHODE ISLAND requiring solid SYSTEMS DEVELOPMENT experience. Client is looking for "hands on type" to work with users to design and implement DATA PROCESSING systems. As the 1st person designated as a "purely systems person" individual could easily develop area into his own department.

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#### ANALYST

\$18-25,000  
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Due to expansion of department of WORCESTER area client, there is need for individual with 3+ years experience in Systems Analysis with background in FULL LINE SYSTEMS DEVELOPMENT from design to implementation. Preference is for candidates from a commercial environment with the ideal person having On Line experience and Programming background.

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Emil Ankerknecht  
**SCI SYSTEMS, INC.**  
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## SYSTEMS ANALYST/PROGRAMMER IV

\$1,439 - \$1,842 per month

Washington State University operates an Amdahl 470 with OS/MVT and a variety of software support languages and systems. OS/MVS is planned for installation in the fall. System Analyst/Programmers are employed primarily in Administrative Services, Academic Services, and the Computing Center providing support for university and external users. At the IV level employees perform tasks at the highest technical level of applications analysis and programming and have team leader responsibilities. Requires one year of experience at the Systems Analyst/Programmer III (independent analyst/programmer) level or equivalent. Business application experience and project leadership experience is desirable. Apply before June 1, 1979, to the Office of Staff Personnel, 134 French Administration Building, Pullman, WA 99164 or (509) 335-4521. Washington State University is an equal opportunity employer.

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Control Data Corporation, the pacesetter in the computer industry offers immediate opportunities in the following areas:

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Here's an opportunity to execute performance analysis of compiler data management and network products. Positions include: Performance Test Base Development, Test Plan Development, and Development of Performance Analysis Tools for standard scientific software products.

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Control Data Corporation offers an excellent salary program and a comprehensive benefit package that includes flexible working hours; company-paid medical, dental, and life insurance; paid vacation and sick leave policy; 100% tuition reimbursement; plus short and long term disability. For immediate consideration, please call COLLECT (408) 734-7434, or submit your resume (or letter of interest) to:

K.E. Beaudet, Dept. CW  
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Sunnyvale, Ca 94086

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### Communications Software Field Support

This position will provide technical and consulting support to customers worldwide on Communications and Network Software for CYBER 170. Tasks involve problem diagnosis, development and teaching of seminars, consulting to customers, technical writing and special project design/implementation. Communications and large systems experience is required. This is an excellent opportunity for both Intermediate and Senior level people.

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Here's your opportunity to design, implement, and maintain a variety of data management projects. A working knowledge of block structures languages required. ASSEMBLY language desired.

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Here's an opportunity to Document state-of-the-art software for the world's leading large scale computer systems. You will prepare use manuals supporting CDC's software production line, including ALGOL, COBOL, FORTRAN, PL/1 and BASIC.

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This manager will provide technical leadership in the development of internal distributed processing networking. We require a strong hardware engineering background applicable to networking using large, medium, and small-scale computers. Proven ability to analyze system failures and direct corrective action also required. Software knowledge is a plus. We require a B.S. in technical discipline with 5-10 years of related technical experience and demonstrated managerial ability.

### COMPUTER SYSTEMS ENGINEERS

We seek technical contributors in state-of-the-art development of distributed processing networking. This position requires a broad hardware engineering background in computer configuration, analysis and design. Software understanding is a plus. B.S. in technical discipline with 3-7 years experience.

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Qualified candidates should call Suzann Scott at (800) 225-7347, ext. 4350, (in Massachusetts call collect (617) 481-7043, ext. 4350). Or send your resume to Suzann at Data General Corp., 15 Tumpike Road, Westboro, MA 01581.

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THE COMPANY OPERATES IBM 3032 AND 370/155 Machines under svs for both batch and real time processing, the latter being used for a variety of commercial applications for companies within the ACI Group.

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A minimum of 3 years involvement in design and programming of efficient CICS systems.

A mastery of PL/1 command level programming.

A knowledge of commercial systems design.

Preferably experience with VSAM.

Tertiary qualifications in an appropriate discipline.

A minimum of 5 years total D.P. experience

If you feel that you can meet these requirements and would enjoy the excellent working environment, career prospects and salary which we can offer, then send your written application with details of qualifications, experience, and references to:

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Australian Consolidated Industries Limited  
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New York, New York 10022

Interviews to be coordinated through the above office and will be conducted in the U.S.A. at San Francisco and New York during May.

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The Military Department (California National Guard) is considering purchase of both hardware and software in order to upgrade its existing Command Information Management Systems. The new installations are to provide information within broad areas, to include accounting, personnel management and resource inventory.

Detailed information as to requirements and certain forms for prospective vendors may be obtained by contacting:

Captain Michael R. Brady, Chief  
Data Processing Services  
Hqtrs, California National Guard  
P.O. Box 214405  
Sacramento, CA 95821  
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We currently have a few ground floor openings for Systems Programming Specialists with 3-5 years IBM Systems Programming experience. Individuals should have working knowledge with IBM System Control Programs including software/hardware internal relationships. In addition, background should include systems programming analysis, internals debugging, and software/hardware diagnosis.

National Semiconductor offers excellent starting salaries and career opportunities. For immediate and confidential consideration, please send your resume along with salary history or call COLLECT to Mr. Terry Mick; (714) 453-1040, extension 206; 10788 Roselle Street, San Diego, CA 92121. We are an equal opportunity employer m/f/h.



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Most professionals these days share a double concern. Work that offers a high level of satisfaction and offers real opportunities for career advancement. And a determination to achieve a good, healthy, secure life for themselves and for their families—something hard to accomplish either in big cities or as suburban commuters.

**NCR/Cambridge, Ohio** is attracting top-notch talent because we very effectively meet *both* of these concerns.



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### Lifestyle Satisfaction:

Cambridge, in SE Ohio, has eight State Parks within a two hour drive. All offer boating, fishing, hiking trails and other recreational attractions. An annual bass fishing tournament is held six miles from our front door. Cambridge itself offers notably pleasant, friendly, stress-free living, a good school system—and an enviably low cost of living.

The following positions have our highest priority:

**Computer Hardware Engineers**  
— Develop terminals for POS Systems. Design, evaluate, test and debug terminals and sub-systems.

Degree and experience in one or more of these areas: Digital circuit design; memory systems; LSI/VLSI; electro-optics; peripherals; system test; logic design; communications; interfaces.

**Project Leader-Simulation and Analysis** — Organize and direct a group to provide simulation and system analysis support for development of interactive POS terminals.

Advanced degree in EE or CS, and 4-8 years experience in performance analysis; characterization and design of multi-computer system architecture; digital communication techniques; real-time, multi-tasking software; disc operating systems; interactive terminal systems.

**Systems Engineers**—Develop systems for wide variety of retail businesses; evaluate market requirements; evaluate and predict system performance.

Bachelor's degree and experience with microprocessors; mainframes; software; performance simulation; miniprocessors; hardware; communications.

**Software Systems Developers**  
— For software systems design and assembly level programming of micro-computer (8080) based systems.

BSEE or Computer Science degree, plus experience in I/O driver design; language processor design; and/or real-time operating system design.

For more information on the quality of life in Cambridge and the rewards of a professional career here, send confidential resume, and salary history, in complete confidence to: Mr. Carl Kline, Personnel Resources, Dept. 050, NCR Corporation, P.O. Box 728, Cambridge, OH 43725.

Or you may call Mr. Kline collect at: (614) 439-0291.

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
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Northwest Arkansas manufacturing firm is seeking an individual with experience in COBOL and JCL. UNIVAC-9030 experience desirable.

Send resume to:

Jet Stream Plastics  
P.O. Box 190  
Siloam Springs, AR 72761

Attn: D.P. Manager

#### Data Processing Manager

Medium sized installation in Southeastern Wisconsin seeking bachelor's degree D.P. Manager with extensive systems, COBOL and management background. Burroughs hardware experience a plus. Attractive salary and excellent fringe benefits. Send resume to Kenneth Niemeyer, 1001 South Main Street, Racine, WI. 53403.

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636 Grand Avenue  
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**Computer  
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Professional career position for non-profit organization. Responsible for D.P. operations on existing minicomputer, and conversion to recently ordered HP 3000, using IMAGE and COBOL. Must have four years experience in the design and implementation of business systems. Previous data base and HP exposure desirable. Please reply in confidence prior to May 22, 1979, including resume, salary history and requirements to Gerald Muto: 3142 J Street; Sacramento, CA 95816.

**Senior Systems Programmer**

The University of Oregon Computing Center seeks applications for a position of Senior Systems Programmer. Applicants should have a master's degree in Computer Science (or equivalent professional experience) and 4 years experience with operating systems for large computers. Experience with timesharing operating systems and computer communications is desirable. The position reports to the Systems Programming Manager. Current practice is to fill the Manager position with a Senior Systems Programmer on a rotating basis.

The Computing Center currently operates an IBM 360/50 using OS/VS1 and a DEC 10 running TOPS 10. The University is in the process of planning for replacement of equipment. The appointment will be a 2 year fixed term and may be renewable. Starting salary is dependent on qualifications. Forward resume by June 4, 1979 to:

**GORDON ASHBY**  
Computing Center, University of Oregon, Eugene, OR 97403  
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PROGRAMMER/ANALYSTS**

Expanding oil & gas company seeks experienced personnel having at least 1 1/2 yrs. experience in COBOL on IBM equipment.

Systems development will utilize IBM's VM/CMS facility with 3278 CRT's. Program development will support multiple locations in Texas and California. Hardware consists of a 370/148 2 MEG machine running OS/VS1.

The merger of several companies has created a groundfloor opportunity for those candidates who have demonstrated an ability to function and progress in this environment. We offer competitive salaries and excellent company paid benefits including health, dental, life, retirement, disability. Qualified applicants send resume & salary history in confidence to Personnel Department.

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**What Computer Professionals Earn**

source edp

**The 1979 Salary Survey**

**1. Non-Management Positions**  
(Salary according to length of experience)

**Commercial Programmers and Programmer Analysts**

6 months - 1 year  
1 year - 2 years  
2 years - 4 years

Annual Salaries (\$000)  
15th Percentile Median 85th Percentile

6 months - 1 year  
1 year - 2 years  
2 years - 4 years

**New National Survey Shows  
Computer Salaries Up 15% for 1979**

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If unable to call, write:

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Oak Brook, Illinois 60521

(When writing, please be sure to indicate home address and current position title.)

**University of Wisconsin  
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ACADEMIC  
COMPUTING SERVICES****Assistant Director  
for Software Systems**

Responsible for academic software systems at UW-EC. Teach one Computer Science course per semester.

Qualifications include strong academic credentials (Ph.D. in C.S. or closely related field preferred), practical experience in areas of responsibility, strong commitment to education. Experience with several systems, including timesharing and networking, and university computing center work preferred.

**Applications Programmer**

Responsible for user consultation and applications programming for academic applications. Qualifications include strong academic credentials (MS preferred), professional experience in program design and development in an academic environment; and ability to work effectively with unsophisticated users.

Appointments begin on or before Sept. 1, 1979. Salary commensurate with training and experience. Apply by July 1, 1979 to J.M. Yohs, UW-EC, Eau Claire, WI 54601. The University is an equal opportunity/affirmative action employer.

**Manager****SYSTEMS MANAGER**

Ore-Ida Foods, Inc., a national leader in the frozen food industry, has an excellent opportunity for a Systems Manager at our Corporate Office in Boise, Idaho. Boise is located in one of the Northwest's major outdoor recreational areas.

This position develops, installs, and supports systems on Data General eclipse computers for factory users; it manages a staff of three. Some travel involved.

Prefer seven years experience as an analyst or project manager on Data General or a similar mini-computer system, with knowledge of Fortran and operating systems. College degree desirable.

Competitive salary, liberal benefits, and relocation provided. Send resume and salary history to: **Employment Manager, Ore-Ida Foods, Inc., P.O. Box 10, Boise, Idaho 83707.**



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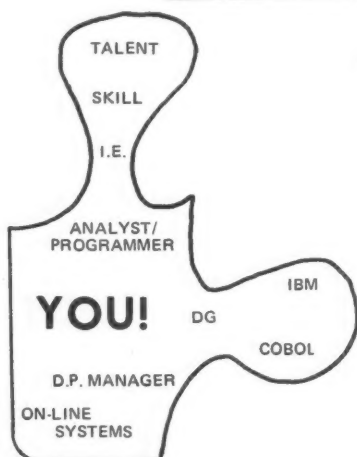
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If you're an Analyst/Programmer (DG, IBM, COBOL), Data Processing Manager or Industrial Engineer Who wants to work on a variety of challenging assignments in the Health Care field, we would be interested in talking to you.

We currently have openings in cities throughout the United States and a few remaining Positions in an exciting Health Care environment in Saudi Arabia

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Design Microprocessor-Based Data System  
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A BSCS degree or equivalent plus experience is needed. The prime adjustment assignment will be design and implementation of data storage and retrieval systems. In addition to attractive salary, benefits, and conditions, the position affords much room for contributions.

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Oversee conversion from System 3 to HP 3000 with this nationally recognized Building Manager Firm. 2+ years design experience and 3+ years COBOL and RPG programming experience. On-line mini experience is a plus. Highly visible position reports to Treasurer. \$28,000.

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## PROGRAMMER

Major metropolitan New York teaching hospital seeks to fill position of Programmer. Minimum 3 years experience programming in IBM 370 DOS/VS & COBOL. Knowledge of DL/I helpful. Applicant should have experience in large DP system in which they have done substantial independent work.

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# Sales/ Marketing Specialist

**ASSIGNMENT:** To develop and implement a total marketing and sales strategy for a brand new high speed printer —for both OEM and end-user markets.

You will identify key markets...structure sales strategies...conduct customer visits, sales presentations, market surveys...negotiate sales...prepare/conduct sales training sessions...work with advertising staff on promotional materials. In short, you will have total responsibility including P&L.

You should be a dynamic, creative Sales maker with solid credentials in selling computer equipment or peripherals for a major computer systems supplier. You should also be a leader who can work with and stimulate the best in others. Position is based in Waynesboro, VA., at the foot of the Blue Ridge Mountains, in the heart of one of the most beautiful living and recreational areas in the East.

Write Mr. M. Stoner, Ref. 48D, General Electric, Data Communications Products, Waynesboro, VA. 22980.

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## APPLICATIONS PROGRAMMERS/ANALYSTS

The City of Albuquerque is experiencing rapid population growth and concurrent increased demand for DP Services. Join us in the stimulating support of this growth using a 370/158 Mod 3 with VSI. Distributed Data Processing, Data Base, and MVS are in our future.

You will be involved in applications system analysis, design and implementation as well as problem determination, solving and maintenance of existing application systems.

Successful candidates will have

College degree or equivalent  
At least 3 years application programming experience  
Detail knowledge of ANS COBOL

It is desirable to have experience of some combination of the following applications:

Financial  
CICS  
Statistics  
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Criminal Justice

Respond by sending a resume in confidence to:

Mrs. Theresa Bartholf  
Production Systems Manager  
Information Systems Division  
City of Albuquerque  
P.O. Box 1293  
Albuquerque, New Mexico 87103

If you wish to converse by telephone prior to mailing your resume, call to:  
Theresa Bartholf on May 24, 1979 from 8:00 a.m. to 5:00 p.m.  
MDT

Telephone Number 505-766-4859

State law prohibits re-location assistance.

## Programmer Analyst

Major Rhode Island based consumer goods manufacturer offers an opportunity to the right individual to expand their horizons in the fast-paced computer field.

We seek a Programmer/Analyst with 3 to 5 years experience preferably in a manufacturing environment. The individual will implement modifications and improvements to Order Entry Production and Inventory Control Systems and further develop other on-line systems. Must have a working knowledge of BAL and RPG II or COBOL. Experience with on-line communications a real plus.

We offer a great opportunity for career growth together with an excellent starting salary and benefits.

Please Send Resume In Confidence To:

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### POSITIONS NATIONWIDE CALL TOLL FREE 800-426-0342

**MVS PROJ MGRS** ..... To 32K  
Must be able to supervise a technical staff in a team environment.

**SR. SYS SPEC** ..... To 32K  
Complete resp. for IBM operating sys. software, IBM 370/SVS or MVS. Be an individual contributor.

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### ANALYST PROGRAMMER

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### Data Processing Project Data Processing Manager

We are looking for a Project Data Processing Manager with at least 2 to 3 years programming experience. You will develop new, and use existing data processing systems, as well as performing some programming for a large, on-going survey project. This is a challenging assignment with a growing survey research firm located on the University of Chicago campus.

A knowledge of PL 1, IBM 370, and JCL is required. SPSS and management experience are desirable. You must be able to function as a link between field and data processing staff.

37 1/2 hour week. Salary range \$16,000 to \$20,000. Liberal fringe benefit package. Send resume only to:

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## International Systems Support Manager

Raychem Corporation has a vacancy for an **International Systems Support Manager (m/f)** in its management information systems department based in Brussels, Belgium.

The position consists of managing a staff group of computer specialists, that provide technical support services to Raychem in the following areas:

- ☐ Burroughs large system computers,
- ☐ datapoint minicomputers,
- ☐ operating system software,
- ☐ data base software,
- ☐ telecommunications,
- ☐ technical utility programming,
- ☐ user consultation and training.

The ideal candidate would have a university degree and currently be managing a technical support group, preferably at a large system Burroughs installation.

Raychem is a multinational company with a leading position in the field of radiation chemistry. The European head office in Brussels has a dual-processor B-6700 and controls a growing network of minicomputers in several European countries and interfaces with a similar system in Raychem's headquarters in California. The position will suit a person who is self-motivated.

Belgium offers many advantages. Very favourable tax regulations exist for foreigners. There is always a large selection of houses/apartments available for rental. There are several English speaking schools, and the company will pay any school fees.

Salary terms and fringe benefits (such as profit sharing) will be commensurate with high level of ability. Removal expenses will be paid by the company.

For confidential consideration, please send details of your career to Paul Osborn, Corporate M.I.S. Director, 300 Constitution Drive, Menlo Park, California 94025, U.S.A.

# Raychem

## PROGRAMMER/ANALYSTS

Be Seen By The Best . . .

M.I.S. International has grown as a successful, highly regarded systems service company because of the efforts and expertise of creative and ambitious professionals looking for a true challenge. Our real time, on line products and services include customer education, data base management, on line warehousing, data acquisition software, and turn key systems. In the long run, we believe the only question is . . .

### If You Are The Best, Why Not Work For The Best?

We have current openings for:

- **Business System analyst/programmers** experienced in COBOL, PL/1, IMS, DMS, IDS
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We have an excellent starting salary for those with demonstrated expertise; regular increases are based on individual merit. Our benefit package is second to none, and relocation costs are provided. If you think that individual effort is important, and want to work for a company that agrees with you, call or send your resume to Mr. Ed Lyons.

## M.I.S. International, Inc.



31350 Smith Road, Room "C" • Romulus, Michigan 48174  
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## Unique Data Processing Opportunities

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### APPLICATIONS PROGRAMMERS

Requirements are 2+ years of PL1 programming experience, interactive program development, structured programming and an ability to function in a team environment are a big plus.

### PROGRAMMER ANALYSTS

We are seeking people with 3+ years of PL/1 programming experience and at least 1 year as a P.A.

### SYSTEMS ANALYST

The successful candidate will have 3-5 years DP experience, with 2 years as an Analyst, and proven ability to work effectively with users at all levels in the company.

A leader in the communications field, we are located in downtown Chicago. We offer an excellent compensation package, consisting of highly competitive salaries and a great benefit program including profit sharing, bonus and dental insurance. If interested, please send your resume with **SALARY HISTORY**, to the address below. We guarantee that you will hear from us either way.

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## Senior Systems Analysts/Engineers Systems Designers

There's a  
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NCR's Communication Systems Division, specializing in development and manufacturing of data communications products and systems, is currently expanding its Advanced Systems Development group.

This unique department provides early definition and systems design of future NCR communications products along with initiation, program management, and startup development of new programs. The group is characterized by working in a state-of-the-art software/hardware environment with opportunities for individual contributions in a systems level scope of design from the conceptual stage to the finished product.

We are currently seeking Senior Analysts and Engineers with a minimum of 3 years experience in any of the following areas:

- Communications Products Design and Definition
- Communications Network Architecture
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All our positions are in our beautiful, sunny South Carolina location, close to the seashores and mountains. Columbia offers a lifestyle that includes both city and country living with excellent recreational facilities for tennis, golf, fishing, boating and swimming. The area also offers excellent housing opportunities, low taxes, and it is the home of the University of South Carolina and other fine educational institutions.

If you are seeking a challenging career with a leader in the industry, need a new lifestyle and have the above experience, we'd like to speak with you.

A degree in Engineering, Math or Computer Science is required. For consideration, please send your resume and salary requirements in complete confidence to: Ken Uhlig, Dept. D50, Industrial Relations, Communications Systems Division, NCR Corporation, 3325 Platt Springs Road, West Columbia, S.C. 29169.

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- A college degree (or equivalent experience)
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If you have these credentials, we have an exceptional career for you at STC.

For fastest consideration with absolute confidentiality send your resume to:

Bill Waibel Dept. CW/5-14 MD-3K

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Give Bill a call TOLL-FREE at 800-525-2940 ext. 6551 or Fred Moore ext. 3008 for further information. We have a lot to say that you'd like to hear.

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Resumes to be received by May 30, 1979, by the Dean of Academic Services, Monroe Community College, Box 9720, Rochester, N.Y. 14623.

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Whether you're looking for an improved Data Processing opportunity-or for just the right person to fill a position - our specialized Data Processing Service can come to your rescue. With affiliated offices, our contacts are vast and varied. Try us... you'll like us!

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Here's where you  
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A chance to showcase all your talents and earn the satisfactions and rewards that belong to the multi-talented. It's the combination of qualities that matter here, ranging from basic excellence in oral, written and analytical skills to an outstanding ability to relate to users, and including that subtle sense of leadership that controls and guides a situation to a successful conclusion.

This is a unique opportunity to participate in the development of a range of financial applications currently being defined by management. Hammermill Paper is unique, too, the Fortune 300 company that puts an unusually high premium on individual initiative and enterprise, the quality that attracts the outstanding professionals on our DP staff.

Ideal candidate will have worked in a manufacturing environment; will have a background in systems design methodology; experience in IBM 370/303X OS/VS; a solid record of achievement in developing and installing financial applications and vendor packages. BS/BA Degree and MSA payroll experience is desirable.

Position located in a friendly, lakeside community combines major metropolitan attractions with the warmth, low pressure and lower living costs of a small hometown - then adds superb year-round recreational facilities. Starting salary is excellent and full benefits include relocation assistance. For immediate consideration, send resume with salary history to:



Mr. J.A. Chandler  
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## FIELD SERVICE ENGINEERS

Our computer services firm is currently expanding its operation and has several openings for qualified field engineers with:

- Training at an accredited electronics school;
- 1-2 years experience servicing mini computers and associated peripherals at customer sites;
- Demonstrated ability to assume responsibility, and a desire to advance at a professional level.

These positions offer a unique opportunity to grow with a growing firm. Salary is commensurate with experience.

Send your resume in confidence to:

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ASSOCIATES, INC. 111 John Street  
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## Tandem Systems Programmer

We're now looking for a highly motivated systems programmer experienced in TAL. Salary to \$27,000. Worthwhile, comprehensive benefits. Plenty of opportunity to grow within a company that's doubled its business volume in the past two years.

This is what you can enjoy at Eastern States - one of the world's largest Master Charge and Visa processing centers.

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## APPLICATION PROGRAMMER

We are seeking candidates for Application Programmer positions with experience on the IBM 3890, (CPCS is preferred). The individual should have 3-5 years of both COBOL and ALC. MVS experience is preferred; however, we will consider talented individuals not having MVS experience.

- \* Group Medical and Life Insurance
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Applications Systems Administrator  
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Personnel Department  
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### FLORIDA

#### MINI COMPUTER SYSTEMS DEVELOPMENT

Leading data processing communication and peripheral manufacturer located in the sunshine state is looking for talented professionals who are interested in leading the design and development (not maintenance) of mini computer systems software. Experience developing software on any mini or micro computer in the areas of operating systems or real time communications or intelligent terminals using ASSEMBLER language is desirable. Please submit resume including salary history or call:

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1211 North Westshore Boulevard  
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813-872-1853

#### MANAGER SALES DEVELOPMENT THE COMPANY

The nation's third largest telecommunications company, a billion dollar corporation publicly held, we serve over 3,000 growing and expanding communities in 20 states. A financially sound company with strong top management team and expanding into new growth markets.

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The individual will be responsible for planning, developing and implementing training programs, measurement systems, and procedural guidelines in the area of sales and sales management. Additional duties include development of training activities for industrial selling functions, including the development of sales strategies.

#### THE CANDIDATE

The qualified individual will possess a good understanding of marketing concepts, industrial selling processes, organization buying behavior, the competitive selling environment and strategies in the direct sales market. Knowledge of training methods and techniques, selection criteria development and general management techniques required. A degree in marketing or any equivalent combination of training and experience preferred. Marketing experience in the telephone industry desirable.

Send resume with salary history to:

Joyce Bier, Personnel Supervisor  
**UNITED TELECOM**  
United  
Telecommunications, Inc.  
USSI/USI  
2330 Johnson Dr.  
Shawnee Mission, Ks. 66205  
equal opp'ty. employer M/F

#### JEFFERSON TECHNICAL COLLEGE Public Two-Year Technical College

Data Processing faculty position opening in the Business Technologies Department to teach Data Processing courses. Minimum requirements: Bachelor's degree in Computer Science or related area (Master's degree preferred), and three years experience in the Data Processing field. Position available September 1, 1979. Academic year contract. Salary range: Instructor \$10,000-16,000, Assistant Professor \$13,000-19,000, Associate Professor \$16,000-22,000, commensurate with qualifications. Deadline for postmark is Saturday, May 26, 1979. Send resume to: Personnel Office, Jefferson Technical College, 4000 Sunset Blvd., Steubenville, OH 43952.

An Equal Opportunity Employer

#### COMPUTER RESEARCH SPECIALIST UNIVERSITY OF FLORIDA

Requires a master's degree in a relevant field and two years of computer research experience OR a bachelor's degree in a relevant field and 3 1/2 years of computer research experience. Also requires recent experience with IBM software systems (OS or MVS) including JCL and interactive programming and programming and systems analysis experience. Prefer MARK IV experience and a background in business/statistics applications. Salary range \$15,000 - \$24,500, with excellent fringe benefits. Send complete resumes with salary requirements by May 21, 1979, to Mr. Robert L. Willis, Administrative Employment Manager, 2nd Floor HUB, University of Florida, Gainesville, Florida 32611.

Eg. Employ. Opp./Affirm. Act. Employ.

## PROGRAMMERS MUMPS

Leading health care systems firm is expanding and seeking experienced MUMPS programmers with degree and at least 1 year of medical systems experience. Position openings are in:

- Washington, DC
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Experienced individuals shall receive top salaries and excellent fringe benefit program with strong growth potential. Join our top notch team servicing more than 30 hospitals throughout the U.S. Call us at 703-821-8858 or send resume to:

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American Management Systems, a nationwide computer services firm with headquarters in Arlington, Virginia, is looking for an individual to fill a newly created systems engineering position.

This position will require a person versatile enough to:

- Consult to the users of AMS' proprietary software package
- Propose equipment configurations
- Plan a computer site
- Deal with the manufacturer(s) to order equipment and track it through delivery and installation
- Perform RSX-11M SYSGENS
- Install AMS generic software on site
- Train AMS users and clients in the use of our products at the systems level

We are looking for someone who thinks well on his/her feet, thrives on diversity, and wants to work hard in a dynamic environment.

Specifically we seek:

- Familiarity with PDP-11 hardware
- Systems programming experience using MACRO-11 running under RSX-11M operating system
- Working knowledge of RSX-11M, MACRO-11, and PDP-11 utilities
- Familiarity with doing RSX-11M SYSGENS

AMS pays relocation expenses, has a competitive benefits package, and will pay an excellent salary to the right person. Send resume with salary history to:

Judith D. Ross  
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## PROGRAMMERS

Siliconix, a technology leader to the semiconductor industry for 17 years, continues to excel in profit and growth, and that means exciting and stable career opportunities for qualified professionals in our Information Services Group.

Siliconix utilizes IBM/370, DOS/VS, CICS and TOTAL. Successful candidates will work with online systems in the manufacturing, order processing and financial areas.

For more information regarding these immediate opportunities call us at (408) 988-8000 ext. 248, or mail your resume in confidence to: Professional Employment, MS 55, 2201 Laurelwood Road, Santa Clara, CA 95054. We are an equal opportunity, people-oriented employer.

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## Software Professionals: At our new Software Systems Laboratory you'll find more than just a blue sky opportunity.

Raytheon Equipment Division proudly announces its new Software Systems Laboratory. And for those unique individuals who qualify for its working team, it's going to present the challenge of a lifetime.

This new Software Systems Lab will offer a technological environment that expands far beyond the parameters of a typical "think tank". You'll be exposed to a challenging range of product variety. You'll find that your work assignments are really growth assignments as you contribute to the development of complete systems that range from micro to large scale to distributed systems.

And because we're as concerned about your growth as you are, we'll make sure that your assignments vary, to give you the full depth and breadth of software challenges, as well as ensuring rapid career development.

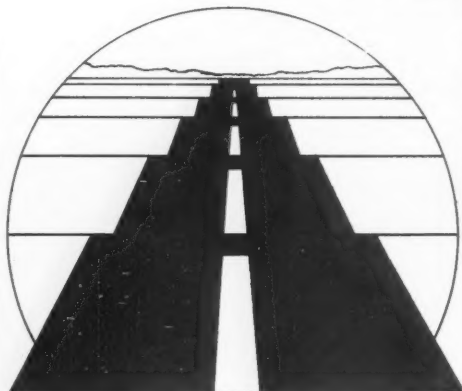
If you're very talented, and enough of a visionary to see far beyond the "blue sky," this new Software Systems Lab will provide fertile ground for your capabilities. The chance to interface with other disciplines ... the satisfaction of producing for many technical programs from state-of-the-art graphics technology to air traffic control to text processing to detection systems to guidance and control ... it's all this, and much more.

The Software Systems Laboratory ... a new facet of Raytheon's Equipment Division.

Talk about "blue sky" — it's a whole new vista of technology.

Openings exist at all experienced levels for **SOFTWARE PROFESSIONALS** with a background in ... or an interest in moving into ... software systems design and development.

Please send your resume, including salary requirements, to V.A. Nickerson, Box A-23, Raytheon Company, Boston Post Road, Wayland, MA 01778.



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Space does not permit us to give a detailed explanation of why this is so (we will address this in our next issue of VANTAGE POINT).

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If you wish to receive a complimentary copy of our publication VANTAGE POINT, call or send letter/resume in confidence to:

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To design and implement interfaces to a variety of operating systems. Must have a background of mainframe operating system design (IBM, Univac), systems software development, and Assembly language programming plus FORTRAN. Some travel required.

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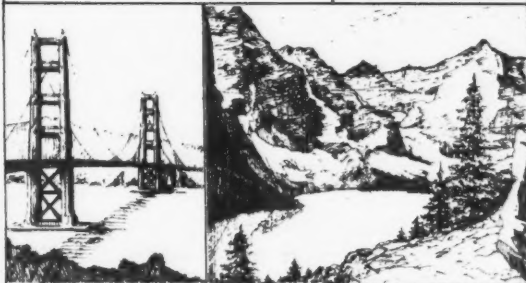
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THE COMPUTER COMPANY  
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**SYSTEMS PROGRAMMING MANAGER**

The State University of New York at Binghamton seeks an individual to lead a small staff of systems programmers in complex technical projects. We presently operate under OS/VS1 on an IteI AS/6 with APL/VS, CICS and Wylbur. In addition to the heavy academic and administrative needs on campus, we support a large network of remote interactive and batch computer users across the state. Experience on large-scale main frames with strong project management background a must. Bachelor's degree in Computer Science or related field required.

SUNY-Binghamton is one of four university campuses in the State University of New York System. The campus of 9,300 students is located near a variety of recreational and cultural resources. A competitive salary/benefit package accompanies this position.

SUNY-Binghamton is an eo/aa employer.  
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SUNY-Binghamton; Binghamton, NY 13901

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### B6700 - B7700

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Groen Division, a Subsidiary of an N.Y.S.E. Corporation, is seeking an individual with minimum 2-3 years experience. Join the No. 1 Company in the Food Service Cooking Equipment Market. Must be action-oriented and willing to assume the responsibility for the systems design and programming effort on major new systems at our autonomous division. Salary commensurate with experience and ability. We offer excellent company paid benefits including profit sharing and tuition reimbursement.

The qualified candidate will have a high degree of skills in most of the following categories:

- Familiarity with IBM Systems III, Model 12
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S/3 Prog/Analyst	22K
Operations Mgr/370	20K
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**PROJECT LEADERS**  
A nation wide diversified manufacturing company is developing a distributed processing information network. This includes installation of mini-computers and prototype application software throughout the company's divisions and subsidiaries. We are seeking individuals with substantial project management exp. utilizing manufacturing and accounting systems, and skill in customer/efficient relationships. Positions will be accountable for full implementation activities as well as cost and schedule performance.

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AND PROGRAMMERS**  
are also needed for these development teams. To \$30K.  
For confidential discussion on these or other opportunities call or write: Al Friedman or Jim Klarn.

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Located in the beautiful Sun Belt area of Atlanta, Georgia, we offer an extremely attractive atmosphere for your over all personal lifestyle. Our headquarters is in a pleasant North Atlanta Suburb, yet is close to the action of the city. Pro-sports such as baseball, basketball, football and hockey are all available in Atlanta. And Atlanta also boasts cultural pleasures such as the ballet, symphony orchestra, theatre and more!

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## RESEARCH PROGRAMMER

Haskins Laboratories offers an opportunity for a resourceful FORTRAN programmer to develop interactive program, for the analysis and display of neuromuscular data. Requires BS degree and at least one year's experience. Salary from \$15,500 to \$20,000 (possibly higher for exceptionally qualified person). Full benefits package (including TIAA/REF if now eligible). Apply to: Ms. Alice Dandourian, 270 Crown Street, New Haven, CT 06510 or phone (203) 436-1774. Haskins Laboratories is an equal opportunity employer.

## DATA PROCESSING MANAGER

Are you ready to run your own dept. Programmer Analyst needed to manage small D.P. dept. for Phila. mfr. 2 years COBOL experience necessary. Knowledge of manufacturing systems helpful. Great opportunity with attractive wages and benefits. Send resume to: H-18, P.O. Box 2068, Philadelphia, PA. 19103. Equal Opportunity Employer.

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Opening for a bright, programmer/analyst. At least two years experience in Fortran 6 preferably using Interdata hardware. Salary 16,000 to 20,000 per year, excellent benefits.

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## WHO NEEDS THE BIGGEST...

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SYSTEMS ENGINEERING LABORATORIES isn't the world's biggest, and that is something you should keep in mind. Especially if you want more for yourself than anonymity in some huge company, just another employee out of thousands. But we're not small, either — our reputation for excellence in our field is enough to show we've got plenty of muscle. SYSTEMS is a company for individuals — a company where challenges are offered, where achievements are rewarded by visibility, recognition, and professional esteem. And individuals, people like you, have made SYSTEMS the leader in the super mini-computer industry for high-technology applications, particularly in the 32-bit product line. Our advanced development group currently has need for the following individuals:

### MICROPROGRAMMER

Must have 1-2 years engineering experience. LSI micro-programming (Z80, 8080, 6800) experience is required with some data communications experience preferred.

### SYSTEMS ANALYST

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Work involves some software development and troubleshooting. Individual must be capable of making modifications to operating systems and developing utility routines. Fluency in FORTRAN is highly desirable.

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FORTAN programmer with a good understanding of logic and firmware design. Project work will involve writing simulators for new CPU's.

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Requires experience in FORTRAN IV and/or assembly language programming and good oral and written communication skills. Responsibilities include both teaching and course development activities.

### SOFTWARE ENGINEERS

Opportunities to contribute individually and in small groups, working on compilers, run-time systems, file systems and major operating systems development. Successful candidates will interact with hardware engineering, advanced systems, logistics and documentation groups. Experience required in ASSEMBLER language and one or more higher level languages, with 1-5 years background in operating systems development. A degree in computer science is preferred.

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Requires 1 year plus experience in CPU diagnostics working for computer manufacturer.

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Experience required in CAD data base for PC and VLSI design.

SYSTEMS is the place to turn your professional potential into solid, rewarding reality. Our location is part of this reality. Florida is one of the country's leading high-technology centers, and what happens here is reflected soon after all around the world. And your personal life? Florida is the answer ... Ft. Lauderdale is the center of the sun-belt action (what have you been missing all those years?) — recreation, water sports, hunting and fishing, exploring ... they all add up to a rare opportunity for your career and your life. Just what you'd expect to find with a company like SYSTEMS.

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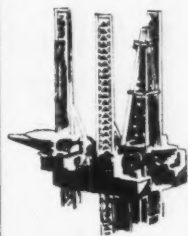
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Must have BS/MS in Geology, Geophysics, Geological Engineering or equivalent geological knowledge gained through experience. Should have a good grasp of the latest oil and gas scientific data processing techniques. Prefer hands-on experience in scientific computer applications dealing primarily with geological and engineering models.

For the right person with the right expertise, this position is going to be creative and fun. Send resume or letter of interest including salary history and requirements to: **Terry Baldwin**.

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Challenging position available for an experienced Information Systems Manager to direct activities of data processing department in expanding 221-bed hospital. Burroughs experience preferred. Submit resume to:

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Our client, a multi-billion dollar international corporation with an outstanding record of growth and expansion, has excellent immediate opportunities for professional programmer/analysts within their data processing division.

Positions require experience in COBOL on large scale IBM equipment with proven design level skills. Must have ability and desire to work in a highly professional and challenging environment. This outstanding corporation has a major systems development program in progress using the latest state-of-the-art equipment.

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**POSITION ANNOUNCEMENT**

**POSITION TITLE:** TECHNICAL MANAGER FOR THE NEW YORK STATE SCHOOL COMPUTER SERVICES SYSTEMS (NYSSCSS)

**POSITION LOCATION:** BOCES Employee — Location to be mutually determined

**ANTICIPATED STARTING DATE:** July 1, 1979

**SALARY:** \$30,000 Range — Dependent upon qualifications and experience

**MAJOR RESPONSIBILITIES OF POSITION:**

NYSSCSS is a statewide system of fifteen regional computer centers, located in regional BOCES, designed to meet the information processing needs of school districts. NYSSCSS now provides computerized administrative, instructional, and research services to over 600 school districts in the State.

The Technical Manager will perform three major functions:

1. Management of the Skills Teams which are responsible for the development, enhancement, maintenance and replication of all of the NYSSCSS Computer Systems in the following areas: (a) Financial, (b) Payroll/Personnel, and (c) Student
2. Interface with State Education Department staff in data collection and other state activities.
3. Serve as Executive Secretary to State Policy Advisory Committee and State Technical Advisory Committee

**REQUIRED MINIMUM QUALIFICATIONS:**

**Education** - Bachelor's Degree (preferably in Business Administration, Computer Science, Management Information Systems, or Mathematics). A Master's Degree or graduate work is highly desirable.

**Experience and Training** - Five years of experience in data processing with demonstrated project management responsibility in a variety of application areas. Training in administrative management practices, skills and concepts. Thoroughly familiar with the design, programming and maintenance of computer software and the establishment of software standards. Must have had experience in implementing data base and teleprocessing systems.

**MATERIALS TO BE SUBMITTED:**

A resume highlighting (1) education, (2) experience and (3) technical and managerial training, and a cover letter indicating your occupational goals and that you are applying for Position Announcement #11-A.

**WHERE TO SEND:** Dr. Leslie F. Distin  
Chairperson, Search Committee  
Broome-Delaware-Tioga BOCES  
P.O. Box 1450  
Binghamton, New York 13902  
May 30, 1979

**DEADLINE DATE FOR SUBMISSION:**

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**LEAD TECH ANALYST**

American National Bank of Chicago is seeking a lead tech analyst with 3-5 years OS systems programming experience, including OS internals and OS/VS 1. This individual will be responsible for development and maintenance of OS utilities and system modifications, as well as problem determination and resolution. A degree candidate is preferred, but we will consider extensive experience. Exposure to Telecommunications and VM-370 would be favorably considered.

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Trout fishing, mountain climbing, tennis, hiking or beaching. Along with no sales or income taxes, there are just some of the many advantages of NH, as well as being only one hour from Boston. Current openings include many programmer/analyst positions from \$13,000 to \$23,000. Manufacturing - RJE, Data Base, COBOL or RPG, Insurance - COBOL, BAL or ROG. For immediate consideration, send a resume in confidence to David J. Osgood, CEC, Vice President.

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Hillenbrand Industries, Inc., a financially strong, diversified manufacturer headquartered in southeastern Indiana is actively recruiting for the following positions:

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Candidates should have experience with IBM-370 DOS/VS TO-TAL, ENVIRON, COBOL. Limited travel required.

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The successful candidate will have

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Respond by sending a resume in confidence to:

Mr. Richard Quillin  
Manager of Operations  
Information Systems Division  
City of Albuquerque  
P.O. Box 1293  
Albuquerque, New Mexico 87103

or,

If you wish to converse by telephone prior to mailing your resume, call collect to:

Larry Schmitt  
(505) 766-7888

on Thursday, May 24, 1979

from 8:00 a.m. to 10:00 p.m. MDT

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2. Provide overall arrangements for the development of administrative support systems, evaluating and recommending priority for major systems; managing routine revisions. Establish and arrange as necessary various remote terminal services centers at the various campuses. Provide services to KISR. (Kuwait Institute for Scientific Research).

**Qualifications:** Five years in second level position of arrangement at a major University computer center which provides academic and research services (and if possible administrative services). M.S. degree.

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## We're looking for Programmers looking for a future in South Florida

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If you're knowledgeable in any of the following areas, we'd like to talk to you about a career with Racal-Milgo: PDP 11, RSX 11M, RT-11, microprocessor-based systems, 8080, 8085, terminal development, DMS-1100, Univac 1100/10, ANS/COBOL or multiplexer software design.

Send your resume in complete confidence to Rod Manning

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## ENGINEERS AND PROGRAMMERS

Lockhead Electronics Company is seeking qualified applicants for immediate positions at NASA's Johnson Space Center in Houston, Texas. These positions are in support of the Space Shuttle and Earth Resource Programs and require applicants experienced in the following areas:

### ENGINEERING ANALYSTS:

Responsible for developing and evaluating math models of spacecraft/aircraft sub-systems including control surface actuators, landing gear systems, etc., for use in large scale digital simulation. Applicants should have a knowledge of FORTRAN and be familiar with techniques for modeling dynamic systems.

### CONTROL SYSTEMS ENGINEERS:

With experience in digital control systems to perform simulation and analysis of spacecraft/aircraft flight control systems. Applicants should have the knowledge of FORTRAN and be familiar with the use of digital and computer analysis of control problems.

### SCIENTIFIC PROGRAMMERS:

Analyze scientific, engineering and mathematical problems and develop numerical models and programs for their solutions on high speed digital computers. Applicants should have a thorough knowledge of FORTRAN and be familiar with the use of large scale computers.

### SIMULATION APPLICATIONS:

Support the development, evaluation and operation of large dynamics simulation dedicated to Shuttle Flight testing. Applicants should have worked with spacecraft/aircraft GUIDANCE, NAVIGATION AND CONTROL SYSTEMS.

### MECHANICAL/AEROSPACE ENGINEERS:

Responsible for development and use of programs for structural, thermal or environmental Control Systems analysis. Applicants must be familiar with and capable of effectively utilizing large scale digital computers in the analysis of engineering problems.

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Support performance analysis of various communications and tracking links accessed by spacecraft/aircraft. Applicant should be familiar with TACAN, MSBS, and GPS Systems, have the ability to develop and evaluate math models, have a high level of competence and written communications and have a knowledge of FORTRAN.

### DIGITAL DESIGN ENGINEERS:

With experience in design and development of digital analog equipment including computer interface, display, control and signal conditioning hardware.

### COMPUTER MAINT. ENGINEERS:

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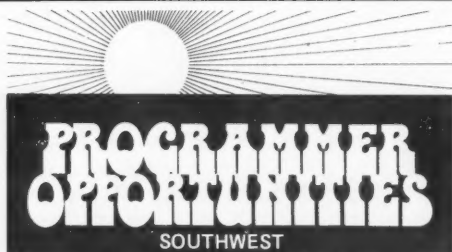
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<p><b>MISSISSIPPI CENTRAL DATA PROCESSING AUTHORITY</b> Sealed proposals will be received by the COPA, 508 Robert E. Lee Building, Jackson, MS 39201, for the following data processing equipment and services:</p> <p>Request for Proposal No. 450 due 3:30 PM, Wednesday, May 30, 1979, for the acquisition of a mark sense reader capable of attaching online to a DEC 1077 computer system.</p> <p>Request for Proposal No. 451 due 3:30 PM, Wednesday, May 30, 1979, for the acquisition of a remote job entry station to attach to an IBM 360/40.</p> <p>Request for Proposal No. 452 due 3:30 PM, Wednesday, May 30, 1979, for the acquisition of a 3704 communications control unit or functional equivalent to interface an RJE to an IBM 360/40.</p> <p>Request for Proposal No. 453 due 3:30 PM, Wednesday, May 30, 1979, for the acquisition of two .80 column ASCII serial, upper-lower case printers to attach to ADDS Regent 100 CRT's via serial buffered RS232 interface.</p> <p>Request for Proposal No. 454 due 3:30 PM, Wednesday, May 30, 1979, for the acquisition of a memory upgrade on a System 3/10 from 32K to 64K.</p> <p>Request for Proposal No. 455 due 3:30 PM, Wednesday, May 30, 1979, for the acquisition of a JE52 compatible remote job entry and data entry system to communicate with an IBM 370/158.</p> <p>Detailed specifications may be obtained from the CDPA office. The CDPA reserves the right to reject any and all bids and proposals and to waive informalities.</p> <p>John A. Ruffin, Finance/Procurement Director Central Data Processing Authority</p>	<p><b>SYSTEM 34's AVAILABLE</b> <b>For Sale or Lease</b> ALL MODELS • NEW/USED • MAY/JUNE DELIVERY CONTACT JONATHAN ELLMAN <b>(617) 298-0010</b> <b>COMMERCIAL SYSTEMS LEASING</b> 1235 ADAMS STREET DORCHESTER, MASS. 02124</p>																																																			

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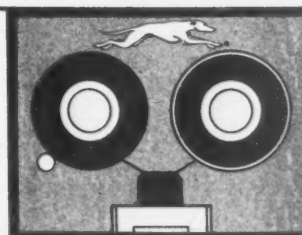
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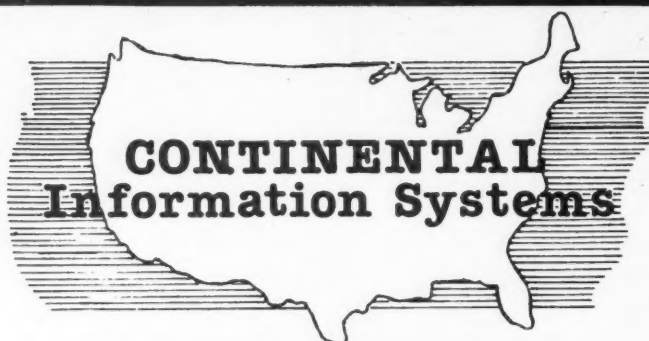
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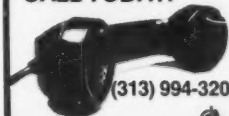
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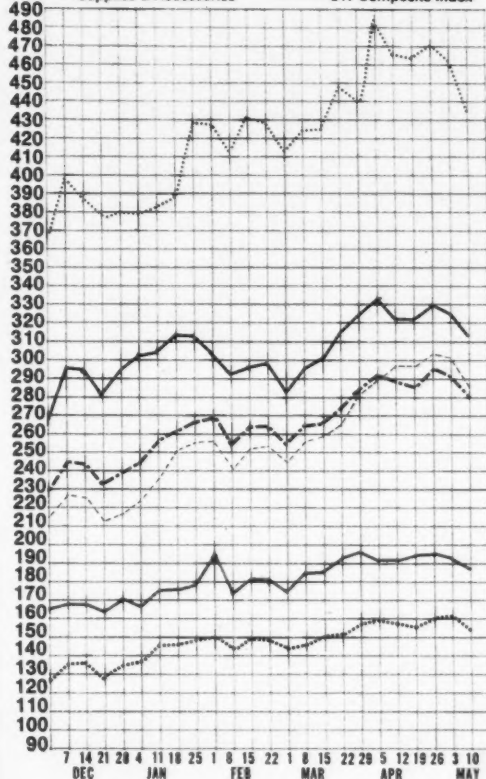
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## APPLIED DIGITAL DATA

Three Months Ended Feb. 28

	1979	1978
Shr Emd	\$ .24	\$ .27
Revenue	11,032,691	8,555,266
Earnings	1,275,889	1,427,289

## COMDISCO

Three Months Ended March 31

	1979	1978
bShr Emd	\$ .58	\$ .18
Revenue	56,326,000	27,837,000
Earnings	2,960,000	893,000
6 Mo Shr	1.37	.37
Revenue	113,732,000	57,944,000
Earnings	6,994,000	1,783,000

a-Restated. b-Reflects two-for-one stock split paid in September 1978 and three-for-two stock split paid in April 1979.

## COMPUTER AUTOMATION

Three Months Ended March 31

	1979	1978
Shr Emd	\$ .14	\$ .89
Revenue	16,635,000	17,075,000
Earnings	286,000	1,763,000
9 Mo Shr	.18	2.32
Revenue	52,084,000	43,801,000
Earnings	367,000	4,809,000

a-Reflects increase in interest in Comshare International to 100% from 45% as of Nov. 1, 1978.

## COMSHARE

Three Months Ended March 31

	1979	1978
Shr Emd	\$ .57	\$ .63
Revenue	17,597,200	7,437,400
Earnings	1,354,000	1,119,100
9 Mo Shr	1.65	1.38
Revenue	36,321,200	18,318,900
Earnings	3,528,400	2,442,300

a-Reflects increase in interest in Comshare International to 100% from 45% as of Nov. 1, 1978.

## GENERAL DATACOMM INDUSTRIES

Three Months Ended March 31

	1979	1978
Shr Emd	\$ .33	\$ .23
Revenue	10,152,000	7,509,000
Earnings	781,000	531,000
6 Mo Shr	.63	.43
Revenue	19,384,000	14,008,000
Earnings	1,478,000	992,000

a-Adjusted for three-for-two stock split in August 1978.

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## Computerworld Stock Trading Summary

All statistics compiled,  
computed and formatted  
by  
TRADE QUOTES, INC.  
Cambridge, Mass. 02139

TRADE QUOTES

CLOSING PRICES WEDNESDAY, MAY 9, 1979

	1978-79	CLOSE	WEEK	WEEK
	RANGE	MAY 9	CHNGE	PCT
	(1)	1979		CHNGE

### COMPUTER SYSTEMS

A ANDAML CORP	28-69	60	-1/8	-0.3
A BURROUGHS CORP	59-87	69	-1 1/2	-2.1
C COMPUTER AUTOMATION	15-44	17 3/4	-3/4	-4.0
N CONTROL DATA CORP	23-44	34 5/8	-1 3/4	-4.8
O CRAY RESEARCH INC	8-33	29	+1/2	+1.7
N DATA GENERAL CORP	62-73	68 1/8	-2 3/8	-3.3
N DATAPoint CORP	34-82	75	-3/4	-0.9
N DIGITAL EQUIPMENT	39-58	54 3/4	0	0.0
N ELECTRONIC ASSOC.	2-13	5 7/8	-1/4	-4.0
A ELECTRONIC ENGINEER	9-19	12	+3/4	+6.6
N FOUR-PHASE SYSTEMS	19-46	33 5/8	-2 3/8	-6.5
N FORNORD	28-40	36 1/8	-3/4	-2.0
D GENERAL AUTOMATION	7-26	16	-1 1/8	-6.5
C GRI COMPUTER CORP	1-3	1 5/8	0	0.0
N HEWLETT-PACKARD CO	62-96	90 1/8	-4 5/8	-4.8
N HONEYWELL INC	43-76	66	-7/8	-1.3
N IBM	236-321	309 3/4	-8 1/4	-2.5
O MANAGEMENT ASSIST	9-29	22 1/8	-1 7/8	-7.8
C MANUFACTURING DATA S	9-25	23 1/4	-1 1/8	-4.6
C MICRADATA CORP	10-23	19 3/8	-2 3/8	-10.9

G MINI-COMPUTER SYST	4-10	4 1/4	-3/4	-15.0
C MODULAR COMPUTER SYS	7-18	14 1/8	-1 5/8	-10.3
N NCR	37-72	70	+5/8	+0.9
N PERMINE COMPUTER INC	20-43	35 3/8	-1 7/8	-5.0
N PERKIN-ELMER	17-36	29 1/2	-1/2	-1.6
N SPERRY RAND	33-51	46 1/2	-1 7/8	-3.8
A SYSTEMS ENG. LABS	11-24	14 1/8	-1/4	-1.7
O TANDEN COMPUTERS INC	13-37	29 1/4	+1/2	+1.7
F WANG LABS.	12-43	37	-4 5/8	-11.1

### LEASING COMPANIES

C BROTHER COURIER CORP	13-21	17	-1/2	-2.8
O COMDISCO INC	3-21	19	+1/4	+1.3
A COMMERCE GROUP CORP	1-1	1 1/2	0	0.0
A COMPUTER INVSYS GRP	1-7	3 1/2	+1/4	+7.6
C CONFIDENTIAL INFO SYS	5-15	6 1/2	-1	-13.3
M DATACOMM-RENTAL	1-4	3 1/4	-3/4	-18.7
A DCL INC	3-6	6	0	0.0
N DPF INC	8-14	10	-5/8	-5.8
N ITEL	16-36	17 1/4	-1 1/2	-8.0
N LEASCO CORP	24-43	37	-1 1/4	-3.2
C LEASPCORP	1-4	7/8	-3/8	-30.0
A PIONEER TEX CORP	3-7	3 3/8	0	0.0
N P.O. LEASING	13-20	15 1/2	-5/8	-3.8

	1978-79	CLOSE	WEEK	WEEK
	RANGE	MAY 9	CHNGE	PCT
	(1)	1979		CHNGE

### SOFTWARE & EDP SERVICES

O ADVANCED COMP TECH	1-2	1 1/4	0	0.0
O ANACORP INC	8-22	15 1/2	-3/8	-2.3
A APPLIED DATA RES.	8-17	8 5/8	-1 3/8	-13.7
N AUTOMATIC DATA PROC	24-36	32	-1 3/4	-5.1
C COMPU-SERV NETWORK	5-14	13 3/4	+1	+7.8
O COMPUTER HORIZONS	1-9	5 1/2	-1/2	-8.3
C COMPUTER NETWORK	5-18	6 5/8	-1/8	-1.8
N COMPUTER SCIENCES	6-17	11 1/4	-7/8	-7.2
O COMPUTER TASK GROUP	1-7	6 1/2	0	0.0
O COMPUTER USAGE	2-4	2 1/4	-1/4	-10.0
O COMPUT AUTO REP SVC	4-10	7 5/8	-5/8	-7.5
C COMSHARE	6-25	24	-1 3/4	-6.7
O CULTIVANE CORP	14-33	19 3/4	-2 1/2	-11.2
O DATA DIMENSIONS INC	3-9	3 3/8	-1 1/8	-25.0
O DATATAB	1-4	2 5/8	-3/8	-12.5
N ELECTRONIC DATA SYS.	15-25	20 1/8	-2 1/2	-11.0
N INSYTE CORP	1-3	1 1/8	-1/8	-10.0
O IPS COMPUTER MARKET	2-3	3	-1/8	-4.0
O KEANE ASSOCIATES	3-6	5 1/4	0	0.0
O KEYDATA CORP	1-4	3 1/2	-3/8	-9.6

A LOGICON	10-19	12 1/8	-1 1/2	-8.4
A NATIONAL CSS INC	15-48	47 5/8	+1/8	+0.2
O NATIONAL DATA CORP	7-13	11 1/8	-5/8	-5.3
A ON LINE SYSTEMS INC	12-30	19 7/8	0	0.0
N PLANNING RESEARCH	6-10	5 7/8	-1/4	-4.0
C PROGRAMMING & SYS	1-1	1 1/2	0	0.0
O RAPIDATA INC	3-7	6	-1/2	-7.6
O REYNOLDS & REYNOLD	18-36	30 1/4	0	0.0
C SCIENTIFIC COMPUTERS	3-9	6 7/8	+1/8	+1.8
N TYMSHARE INC	10-41	37 5/8	-3/4	-1.8
A URS SYSTEMS	5-8	5 3/4	0	0.0
N WVLY CORP	1-7	6 1/4	+3/8	+6.3

### PERIPHERALS & SUBSYSTEMS

N ANDERSSONGRAPH-NULT	14-32	14 3/4	-1/4	-1.6
N AMPER CORP	10-19	18	-1/4	-1.5
O ANDERSON JACOBSON	3-10	7 1/2	-1/2	-6.2
N APPLIED DIG DATA SYS	8-22	8 5/8	+1/8	+1.4
C REEMVE INT'L	3-7	5	-3/8	-7.5
A BOLT, BERANEK & NEW	6-14	12 1/4	-1 1/2	-11.0
N BUNKER-RAND	10-25	23 3/4	-1/8	-0.5
A CALCOMP	3-13	8 1/2	-1	-10.5
C CAMBRIDGE MEMORIES	3-9	3	-1/8	-4.0
N CENTRONICS DATA COMP	16-46	44	-1/4	-0.5
C COGNITRONICS	1-4	2 3/8	-7/8	-26.9
C COMPUTER CONSOLE	6-14	7 3/4	+1/8	+1.6
O COMPUTER CONSOLES	4-12	11 1/2	0	0.0
A COMPUTER EQUIPMENT	3-8	4 1/2	-1/4	-5.2
C COMPUTER TRANSCIVER	1-5	2 3/4	-1/8	-4.3
C COMPUTERVISION CORP	9-53	24 3/8	+3 1/4	+6.4
C CONTECH	9-38	24 1/2	0	0.0
N CORARC CORP	13-26	14 3/4	-1/2	-3.2

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	(1)	1979		CHNGE

O DATA ACCESS SYSTEMS	3-14	8	0	0.0
A DATA PRODUCTS CORP	14-25	17 1/4	-1 5/8	-8.6
C DATA INC	2-6	2 1/4	-1/4	-5.2
O DECISION DATA COMPUT	2-6	6	-1/4	-5.8
O DELTA DATA SYSTEMS	1-1	3/8	0	0.0
A DECUMATION INC	6-34	23	-1	-4.1
O DATAPAC CORP	6-32	16	-1 1/2	-8.5
N ELECTRONIC M & M	4-9	3 3/4	-1/8	-3.2
C FABRI-TEK	1-2	3/4	0	0.0
C GENERAL COMPUTER SYS	1-3	2	-1/4	-11.1
O GENERAL DATACOMM IND	9-21	15 1/4	-2	-11.5
N HAZELTINE CORP	10-17	15 1/4	-1 1/2	-8.9
N HARRIS CORP	17-36	27 5/8	-1 1/4	-4.3
O INFOTEX INC	6-11	7 3/8	-3/8	-4.8
O INFORMATION INTL INC	7-12	9 3/4	-3/8	-7.1
O INFOTON	1-3	2 3/4	-3/8	-12.0
C INTEL CORP	26-48	45	-1	-2.1
O INTERSIL	7-19	13 3/4	-1/4	-1.7
A LUNDY ELECTRONICS	4-8	7 1/4	+7/8	+13.7

C MSI DATA CORP	10-19	10 3/8	-1/2	-4.5
N MEMDEX	27-59	34	-3 3/4	-9.6
N MOHAWK DATA SCI	6-15	10 7/8	-1/4	-2.2
C OMEX	2-8	7	0	0.0
O PARKROYNE CORP	9-18	14 3/4	-3/4	-4.8
C PERMUTEC CORP	5-12	15 1/4	0	0.0
N PERTEC CORP	9-17	6 5/8	-1	-10.3
A POTTER INSTRUMENT	2-2	1 3/4	0	0.0
C RECOGNITION EQUIP	7-13	8	-5/8	-7.2
O SCAN DATA	1-5	2 5/8	+1/8	+5.0
N STORAGE TECHNOLOGY	19-46	39	-5 1/2	-12.3
C T RAY INC	11-22	17 1/4	+1/4	+1.4
C TALLY CORP	4-14	12	0	0.0
A TEE INC	6-13	7 1/8	0	0.0
N TEKTRONIX INC	33-57	51 3/4	-2 1/4	-4.1
A TELER	3-9	4 7/8	-3/8	-7.1
C TEODATA SYSTEMS CP	9-24	21	-2 1/4	-9.6
C WILTR INC	1-2	5/8	0	0.0

### SUPPLIES & ACCESSORIES



**Joan Cosbey**  
Manager — personnel services.

**William E. Coday**  
VP, director — employee relations.

**Richard G. Patterson**  
Manager — corporate systems.

## Ralston Purina's continuing program for human resource management.

### Top level support and InSci.

Bill Coday is VP and director of employee relations at Ralston Purina. He's probably done more than anyone at Checkerboard Square to professionalize the personnel function. Two of his moves: continuing senior management support and a continuing relationship with InSci.

"Personnel has come of age," he says. "In any area — employee records, benefits, EEO, compensation and so on — you have to know the discipline. You have to be a professional, set direction, provide support from the top down. Above all you need information. That's where InSci comes in. In a company such as ours, we need the flexibility of InSci systems. And the expertise of InSci people that goes far beyond the systems."

Adds personnel services manager Joan Cosbey, "Our data was spread out, limited, not available in standardized form. Moreover, the company had doubled in size. Government regulations were strangling us. We had to have a better system."

Ralston Purina has that system now — with firm plans to add more InSci capabilities. Claims corporate systems manager Dick Patterson, "It's the easiest system I've

ever installed. It has actually reduced our DP investment in the personnel function."

Continuing professional support is the kind of value you can expect from InSci. We have designed and installed personnel/payroll systems for more than 550 corporations. InSci has the only personnel system to receive the 50 million dollar sales achievement award. And human resources is our only business.

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in people  
management**

